DOCTORAL THESIS

An investigation into the relationship between design thinking and skilled knowledge in craft education

Sato, Maho

Award date:
2010

Awarding institution:
University of Roehampton

AN INVESTIGATION INTO THE RELATIONSHIP BETWEEN DESIGN THINKING AND SKILLED KNOWLEDGE IN CRAFT EDUCATION

Maho Sato, B.A., M.A., M.A.

A thesis submitted in partial fulfilment of the requirements
for the degree of PhD

School of Education
Roehampton University
2010

ABSTRACT

This research is about craft education in schools in England and Japan. In the specialist literature, skilled knowledge has always been identified as the main outcome of craft learning in schools, but contemporary rationales for craft education include fostering children's design thinking understood as a process of developing creative ideas. At the time this research began in 2005, Japanese government policy for craft education emphasized creative problem solving and designing together with making skills. However, developing design ideas and skilled knowledge may be conflicting aims. There was very little guidance for Japanese craft teachers about how to teach creative thinking and more theoretical discussion about design in England. So I studied how design thinking is taught in England with a view to this contributing to craft education in Japan.

The research method was qualitative and comparative. In the first phase, analysis of policy documents for Art & Design and Design & Technology and fieldwork in three primary and five secondary schools was conducted in England. In the second phase, policy documents for Art & Handicraft, Art, Home Economics and Technology & Home Economics were analysed and fieldwork was conducted in the first two subjects in seven primary and six secondary schools in Japan. Then the findings were compared and analysed qualitatively.

This research confirmed that skilled knowledge is central to craft education in schools in both countries. There was a significant influence of school subject domains on how crafts were taught in class. The lack of any specification for thinking skills in the learning domains for craft education in Japan may explain why there is less emphasis on teaching design thinking than in England. I concluded that it is possible to teach design thinking and skilled knowledge successfully together in craft projects. However, it is difficult to apply this in practice in school contexts because they often lack relevant staff expertise, time and authentic materials and tools.

At the end of the thesis possible ways of teaching design thinking and skilled knowledge together are suggested in the form of a domain model of art curriculum and an interactive design process model. Some strategies for teaching design thinking identified in England could provide a basis for future curriculum development in Japan.

ACKNOWLEDGEMENTS

I could not have completed this thesis without the support from many people. Above all, I wish to express my deepest gratitude to my Director of Studies, Professor Rachel Mason, for her diligent tutorial support and insightful critiques. From her, I learned about a professional researcher's role and work.

I wish to express thanks also to my co-supervisor, Dr. Dorothy Bedford for her advice and kind encouragement and to my Japanese advisor, Dr. Kazuji Mogi, for his support to the research in Japan.

I appreciated my fellow students' companionship and assistance. When I experienced difficulties in this research or felt lonely they always supported me.

I would like to acknowledge the contribution of all the students and teachers who participated in the research in England and Japan.

I would like to express thanks to my landlady, Ms Anne Rogers for her support during my stay in England. Her great sense of humour encouraged me when I faced difficulties.

Finally, I would like to dedicate this thesis to my family. My parents and sister have long been looking forward to the completion of this thesis. Without their support and love I could not have completed this work.

LIST OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

0. 1 Background to research

This research project set out to investigate the relationship between design thinking and skilled knowledge in craft education. The research inquired into the possibility of combining the teaching of design thinking with skilled knowledge in craft activities in primary and lower secondary school settings in Japan.

0. 1. 1 My personal background

This research originated from a personal interest in making and teaching crafts in Japanese schools. I was born in a small village in a northern part of Japan. My grandfather and grandmother built the wooden house we have lived in since then because they did not have much money after World War Two. When I was a small child, I used to see my grandparents and parents making and repairing things at home. My grandfather was particularly interested in making. He repaired farm machines and his own trousers with a sewing machine, and had hobby crafts such as *origami* or bead craft. He was *kiyou* (dexterous in making) and I always wanted to make things like him. Reflecting on my childhood now in England, I realise that I had many opportunities to see craftwork at home and making is a part of my identity. In university, I studied *nihon-ga,* a kind of traditional Japanese painting. While I was interested in Japanese traditional techniques and materials and tools, I struggled to develop my own ideas. I wanted to teach Japanese traditional arts and crafts in schools but it was difficult to do because I lacked knowledge of pedagogy. Since then, my interest has gradually moved to teaching and learning art and craft rather than producing my own artwork. When I

came to the UK to study art education in 2003, my interest in teaching Japanese traditional crafts increased. The multicultural nature of British society led me to begin to adopt a cultural perspective on art education. Consequently, I decided to investigate the teaching of traditional crafts in Japanese lower secondary schools for my MA dissertation. I hoped this would improve my own teaching of Japanese traditional crafts, as well as contribute to further research on this topic. Through this research, my interest in how craftspeople develop individual ideas in skilled making activities increased. When I was a university student in Japan, I worked as a part time assistant Web designer for three years and had reflected on the range of 'design and making' in commerce and industry. This was one reason why I decided to explore the relationship between design thinking and skilled knowledge in craft education for my PhD. I also wanted to develop my research skills in order to contribute to the study of art and craft education in Japan where scientific method is not yet understood or widely used.

0. 1. 2 Broad problem area

According to Gardner (1990), craft can be explained as a distinctive form of skilled knowledge that is intuitive, acquired through an apprenticeship mode of learning and expressed through making and doing. In this definition, craft could be anywhere but this research focused on making in art in schools. Mason and Houghton (2002) understand skilled knowledge as central to craft education in schools and making skilfully as important. I had defined craft at the start of this research as knowledge of how to make something skilfully and well by manipulating and controlling materials, tools, equipment and processes.

In the Japanese and English education systems, craft is located in different school subjects. During the time I conducted this research, craft was taught in 'Art & Handicraft' and 'Home Economics' in Japanese primary schools and in 'Art' and 'Technology & Home Economics' in Japanese secondary schools. According to Kumamoto (1970), two conflicting kinds of craft education, 'scientific' and 'aesthetic' were introduced into the Japanese school curriculum around 1910. The educational reforms of 1969 located 'aesthetic and scientific crafts' within the subjects of 'Art & Handicraft' and 'Home Economics' respectively. However, the concept of '*kogei*' (craft) is exclusive to art and as such is distinguished from 'fine art'. In the Japanese national curriculum for art, unlike England, crafts are understood as a distinctive art form. However, comparative survey research carried out by Mason, Nakase and Naoe in 2000 identified a decline in craft education in Japanese secondary schools as was the case in England and Wales.

In English and Welsh schools in 2005, craft was being taught in two school subjects called 'Art & Design' and 'Design & Technology' but was not named. In 1989, the subjects called 'Craft, Design & Technology' and 'Home Economics' were replaced by 'Design & Technology' and the word craft was left out of the National Curriculum because the working group explained the concept is too narrow. In 1992, the subject previously called 'Art, Craft, & Design' was renamed 'Art & Design' by the National Curriculum Art working group. The reason they gave was that art and craft had become so intimately linked that it was better to treat them as one (Department of Education and Science, 1991). According to Burgess and Schofield (2003), this led many schools to neglect craft, craftspeople and craft history all together.

Skilled knowledge refers to knowledge expressed through doing and making well (Gardner, 1990, Mason, 2000, Mason and Houghton, 2002). In Japanese literature on this topic, skilled knowledge is considered fundamental to general education. Hamamoto (1992) maintain that skilled knowledge is central to craft education, together with functionality, and that judgements about the aesthetic qualities of objects are closely associated with the ideal of craftsmanship. My previous research (Sato, 2005) found that Japanese teachers understood expert craftsmanship as the main characteristic of traditional Japanese crafts. Additionally, they understood craft learning as essentially practical. John Dewey's theory of pragmatism, which justified craft activity in terms of 'learning through doing in practice', strongly, influenced Japanese general education in the 1940s (Miyahara, 1995). In Japan, craft is also understood to be character-forming in that it teaches children a sense of responsibility and perseverance. In craft lessons, children have to take responsibility for all the processes involved in making a piece of craft work, and handling and caring for tools and this teaches concentration and patience (Robertson, 1961, Hamamoto, 1992). This attribute is particularly valued by Japanese art teachers (Sato, 2005).

Similarly, a national survey of craft and craft education in Design and Technology and Art and Design in England and Wales, defined craft as skilled knowledge 'derived from manipulation of materials and processes and making artefacts competently and well' (Mason and Houghton, 2002; 62). It found that the majority of teachers and pupils highly valued 'the concrete learning achievements and sense of control over the environment gained through skilled knowledge' (2002; 62). Unfortunately, these educational values

associated with craft had been neglected in recent National Curriculum policy for both Art & Design and Design & Technology.

Dormer (1997) has consistently argued that some aspects of craft knowledge cannot be expressed verbally, and that demonstration and practice, which are characteristics of the apprenticeship model of learning, are the best way to learn crafts. Research into crafts in English and Welsh secondary schools by Houghton in 2000, found that students liked demonstrations by teachers. My previous research (Sato, 2005) found that Japanese secondary school students and teachers also considered demonstration by experts the best way to teach and learn craft skills, suggesting an apprenticeship method of learning.

In Gardner's theory of multiple intelligences (1990), bodily kinaesthetic intelligence that involves using ones own body to solve problems is linked to craft and skilled knowledge. People who have this kind of intelligence are good at making things. He believes that the reason craft education is particularly helpful for developing bodily kinaesthetic knowledge is because it is tied to doing and the physical handling of materials and tools. What makes his work special for me is that he refers to the interaction between body and mind. Although Gardner's theories are derived more from his own intuition not from empirical evidence gained from scientific research, they have helped many educators to question their work and encouraged them to look beyond the limited curriculum policy and testing (White, 1998, Project SUMIT; 2000). This theory may help me examine craft education in schools that is considered low status because it involves physical activity more than thinking.

Definitions and concepts of craft were confused in both countries at the start of this research and were changing (Mason, Nakase and Naoe, 2000). In Japan, until the modern period, no distinction was made between art and craft, and the term *kogei* is a translation of a western concept (Sato, 1996, Kitazawa, 2000, Hida, 2006). Traditionally, in Japan, the term 'craft' includes both artistic and functional dimensions. However, contemporary crafts are not always functional. In England, 'function' is not specified as an attribute of craft in the National Curriculum for Art & Design. Moreover, this curriculum emphasises aesthetic expression and individuality (Burgess and Schofield, 2003) and people's understanding of craft is much closer to fine art in England than in Japan. The difficulty of distinguishing between fine art and craft in contemporary societies may have contributed to the decline in craft education in England (Ibid). In 1997, for example, Dormer pointed out there was a view that craft knowledge conflicts with originality, freedom of thought, imagination and expression because it is communal and created by many people. In Japan, Idekawa (1997) reported that individual craftspeople struggle to combine trying out new ideas with applying skilled knowledge gained through experience. While craft was initially introduced into general education as a practical subject in many countries, at the time this research began the emphasis on development of cognitive abilities including creativity and problem solving was common to contemporary rationales (Kumamoto, 1970, Mason and Houghton, 2002).

0. 2. 3 Specific problem area

Creativity has been widely debated in general education in Japan since the 1980s. The most recent Courses of Study state that it is the basis for developing children's ability to

learn and think independently (Ministry of Education, Culture, Sports, Science and Technology (MEXT), 1999a, 1999b). Fostering creativity through craft activities is stated aim of the Courses of Study for Art in secondary and primary schools (MEXT, 1999a, 1999b). The Course of Study for Art & Handicraft at primary level, points out that drawing is taught more often than handicrafts, calls for more craft activities in art lessons and all pupils to learn to make crafts skilfully by hand (MEXT, 1999a). The Course of Study for Art & Handicraft at primary level also refers to 'creative handicrafts (創造的な工作)' and states that extending pupils' creativity through 'making' is important (MEXT, 1999a; 66). Creative handicrafts are defined as activities in which pupils use skills to change, develop or construct materials and initiate ideas about a subject or expressive intention (MEXT, 1999a). The Course of Study for Art & Handicraft in primary schools states that;

> in order to foster ability in creative handicrafts, pupils should not only be taught skills but also experience the joy of making, working hard, trying out new ideas, and developing beauty and goodness.
> つくりだす喜びを一層味わえるようにするとともに、一人一人が持てる力を十分に働かせ、新たな発想や表し方を試みたり、よさや美しさなどを見つけたりして。 (MEXT, 1999a; 68)

One learning objective for craft in the Course of Study for Art in lower secondary schools is that;

> pupils should make craft works and in doing so explore individual ideas taking into account function, individual imagination beauty, and how to manipulate materials and tools.
> 使用するものの気持ちや機能、夢や想像などから独創的に発想し、造形的な美しさ、材料や用具の生かし方などを総合的に考え、創意工夫して作ること。(MEXT, 1999b; 73)

Policy makers explain that pupils have to gain knowledge of basic craft skills, however, to be able to put their own ideas in to practice (MEXT, 1999b).

Creativity is an elusive concept used in different ways in different contexts and variously described; for example, in relation to artistic products or the abilities of people who produce them such as designers and writers (Howe, Davies and Ritchie, 2001, Bentley, 2000). Maeda, a Japanese psychologist (1997), defines it as the ability to develop ideas or solve problems in novel situations and to create new things that are valuable socially and culturally (individually). According to Bentley (2000), the term refers to 'the application of knowledge and skills in new ways to achieve a valued goal (18). As Bentley points out 'creative use of knowledge' is central to the ability of humans to thrive in new environments in the future (2000; 17). It is widely argued that creative thinking is fundamental to all areas of everyday life (Maeda, 1997, Department of Education and Employment (DfEE), 1999, Bentley, 2000, Howe, et al, 2001).

Although the concept of creativity was first introduced into 'Drawing & Handicraft' in Japan in the 1960s, preliminary searches did not identify any Japanese research that related it to craft education. Before the research began I looked at literature about creativity and art, craft and design education in England and this helped me to refine the research problem. For example, I found that there was an emphasis on developing ideas and fostering children's creativity in lessons in Art and Design and Design and Technology in England (Department of Education and Employment & Qualifications of Curriculum Authority (DfEE & QCA, 1999; 14, 2004; 15). A National Curriculum for Design & Technology, for example, stated that pupils should develop personal ideas and identify needs for a specified product considering its function, users, materials and tools before they started to make (DfEE and QCA, 2004). The more recent change to

the National Curriculum for Design & Technology was to encourage students 'to become autonomous and creative problem solvers' (DfEE and QCA, 2004; 15). In Art & Design, creativity was understood as the process of developing individual ideas, and critical thinking was considered a fundamental component of creativity (Parker, 2005).

According to Noman, design thinking is 'an inventive process' which emphasizes problem-solving thought and action (2000; 96). Since theories of creativity are applied to a wide range of subjects and I only wanted to study craft and making, a decision was taken at the start to use 'design thinking' as the key concept rather than creativity. In this research, therefore, design thinking is defined a mode of thinking in which people generate and develop their own ideas for making objects or products (Noman, 2000).

The key research question centred on the issue of how to develop students' design thinking in craft education. A finding from research into creativity in Design & Technology by Rutland in 2005 was that students' creativity is released when teachers lead lessons with 'a light touch', allow them time and freedom to explore ideas and get them to test them out in models before committing themselves to finished products. The Japanese Course of Studies for art also states that teachers should give pupils freedom to choose materials and tools, and make what they want (MEXT, 1999a, 1999b). However, this may not be appropriate for craft education given that each craft requires in-depth knowledge of specific techniques, materials, and tools. In addition, Dormer (1997) suggested that the most efficient way of learning a craft is through demonstrations by expert makers using the apprenticeship model of learning. This

conflicts with Rutland's ideas about autonomous learning and the emphasis on students developing and researching ideas themselves.

Creativity is understood in different ways in different cultures. One of the main differences between Western and East-Asian countries is the relative importance they attach to learning basic skills (Gardner, 1989, Sato, 2002). According to Gardner (1989), creativity in China refers to only a 'modest alteration of existing schemes or practices'. In America, on the other hand, it refers to a 'radical re-conceptualization' of a problem, involving exploration of ideas (155). When Sato (2002) researched tradition and innovation in ink painting in Japan, she found that the Asian tradition of learning techniques is understood as the basis for developing creativity and producing original work (Sato, 2002). The Chinese teacher and Japanese students she studied valued a variety of traditional learning outcomes such as mastery of skills, understanding old masters' ways of thought, expression of *kokoro* (feeling) and depth of understanding of subject matter. She suggested that these criteria were more appropriate in this context than the western ones of novelty or originality (Ibid). My previous research (Sato, 2005) had established that Japanese lower secondary teachers did not spend much time developing students' design ideas for their craftwork and many students just copied designs from magazines or textbooks. However, there is no scientific empirical research into how students generate and develop their own ideas is being encouraged in craft lessons in primary and secondary schools in Japan.

0. 2 Summary of problem statement

In the past, craft education in England and Japan has emphasised skilled knowledge, but this situation may be changing. The Japanese national curriculum for art requires more emphasis on craft and on creativity and design thinking at the same time. However, teaching design together with skilled knowledge acquired through apprenticeship may be conflicting ideas. There was very little guidance for Japanese teachers about how to introduce design thinking into craft lessons. Preliminary research had identified more discussion about design thinking and craft education in England so a decision was taken that researching this might be useful for conceptualising the problems involved in enhancing craft education in Japan.

0. 3 Research questions

The research questions that underpinned this study were;

1. How is craft conceptualised in Japanese and English educational policy and practice?
2. Which methods do Japanese and British art teachers use to develop creative design ideas and craft skills and techniques? (how are they similar and different?)
3. Is a skills-based craft curriculum compatible with one developing individual design ideas?
4. How are or should these learning domains be combined, if it is possible?
5. Is there anything Japanese art educators can learn from recent developments in craft education in England?

0. 4 Organization of thesis

Chapter 1 reports the findings from a review of literature on craft and craft education. The chapter presents and discusses findings from existing research and theories of

crafts, skilled knowledge, creativity and design. This review helped me formulate a theoretical framework for the research. Chapter 2 reports on the research design and data collection and analysis and issues of reliability and validity and ethics. Chapter 3 reports on the current situation in craft education in England. It presents the findings of an analysis of policy documents and fieldwork carried out from February to July in 2006 in primary and lower secondary schools and includes my reflection on the data. Chapter 4 reports the current situation in craft education in Japan. It presents the findings of an analysis of policy documents and fieldwork carried out from November 2006 to April 2007 in primary and lower secondary schools and includes my reflection on the data. Chapter 5 reports on a comparison and interpretation of the key findings from the research in the two countries. Chapter 6 presents the conclusions and answers the research questions. It also reflects on the methodology and concludes by discussing the contribution of the research to knowledge and the implications for theory, policy and practice, with particular reference to Japan.

CHAPTER 1
CRAFT AS SKILLED KNOWLEDGE, CREATIVITY AND DESIGN

1. 1 Introduction

In the introduction, I identified some problems in craft education theory, policy and practice. I concluded by identifying a specific research problem and formulating research questions. The aim of this chapter is to report the findings of the review of theories of craft, skilled knowledge, creativity and designing that helped me to refine the research questions, formulate research instruments, and create themes for analysing the empirical data. The specific aims were;

To further investigate concepts of craft, skilled knowledge, creativity and design, and the relationships between them;
To identify justifications for craft education in schools;
To identify, develop and analyse methods used for teaching skilled knowledge and design thinking, and the ways of combining them.

In carrying out this review, I discovered comparatively few texts devoted exclusively to craft education and design thinking. It was necessary, therefore, to read books and journals which focused principally on other topics; for example design or art education. Books and journals used for this review were located in the following disciplines: education; art and design history; sociology; psychology and cultural studies. They were written in both Japanese and English so extracts from the Japanese texts have been translated where they are cited in this chapter.

1. 2 Theories of craft and craft learning

1. 2. 1 Craft and skilled knowledge

The identified main concepts related to craft knowledge were skilled knowledge, craftsmanship and tacit knowing and they will now be discussed.

1. 2. 1. 1 Skilled knowledge

The idea of craft as skilled knowledge originated in Gardner's theory of knowledge (1990) (is also it called bodily kinaesthetic knowledge). His theory of multiple intelligences supports the claim that craft in education is important. According to Gardner (1983), there are six distinct forms of knowledge; linguistic, logical/mathematical, musical, spatial, bodily kinaesthetic and personal. Bodily kinaesthetic knowledge is developed through sensory perception and motor actions. Gardner (1990) defines craft as a distinctive form of skilled knowledge that is intuitive and expressed through making and doing. He explains that craft education contributes to the development of bodily kinaesthetic knowledge, since it is tied to the physical handling of materials and requires motor control.

Gardner pointed out that all cultures have practical disciplines with skilled knowledge that is mastered by individuals and passed on from one generation to another. Practical disciplines involve levels of competence ranging from novice to expert (Ikuta, 1987, Gardner, 1990). In traditional apprenticeship systems of learning, a novice is initiated into the craft tradition practiced by a valued adult professional and allowed, little by little, to take responsibility and autonomy for the work. However, in information technology societies, such knowledge is valued less and is sometimes neglected (Ikuta, 1987). Gardner (1990) admits that the learning of skilled knowledge originates from the early sensory motor or intuitive knowledge of children. They learn various things through looking at what adults do and doing it by themselves. He claims that skilled people integrate various forms of knowing/knowledge in the development of a culturally valued domain (Fischer, 1980, Gardner, 1990).

When Mason and Houghton researched craft education in secondary schools in

England and Wales in the 1990s, they concluded that;

> Whilst we accept that the concept of craft is problematic at a time when making is experiencing a fundamental paradigm shift, it connotes something very important – namely, the skilled knowledge that is derived from fashioning artefacts, artwork, systems and objects competently and well (2002; 62).

Although they found that craft education was declining in schools, they pointed out that skilled knowledge is crucial to facilitate the concrete learning achievements teachers and their students value most in art and design lessons. They also argued that;

> Such educational benefits only accrue where aesthetic judgements (judgements of quality) about the manipulation of materials and processes are recognised as important in the design and make process and where making operates within a specific discipline base (2002; 62).

Therefore, skilled knowledge is central to craft education.

1. 2. 1. 2 Craftsmanship

There is no word for 'craftsmanship' in Japanese. However, it can be translated as *shokunin-no-gino,* which refers to artisan skills or skilled competence.

According to Brown, the word, craftsmanship refers to 'some standard of conventional performance' (1997; 6). Also, it relates to 'the functional meaning in artefacts' and provides 'a pre-existing condition for craftsmen being able to perform their work' (1997; 6). David, Pye (1968) called this standard of performance the craftsmanship of certainty. Accomplished labourers are able to produce a certain level of quality in their work although the quality of work is always at risk.

According to Pye (1968), craftsmanship means simply workmanship using any kind of technique or apparatus, in which the quality of the result is not predetermined but depends on the judgement, dexterity and care which the maker exercises as he works. Brown explains craftsmanship as 'the customised adoption of skill to circumstance'

(1997; 6).

Similarly, Coy suggests that craftsmanship engenders ‘ownership of specialised skills’ (1989, 5). In workmanship, care counts for more than judgement or dexterity; it may well become habitual and unconscious (Pye, 1968). Those scholars all agreed that craftsmanship refers to the predetermined quality of a work and the control of skilled knowledge that is necessary so as to create quality things/ideas. The quality of the work is predetermined, but is at risk in the making processes. In craftsmanship, skilled knowledge is used to solve new or unfamiliar problems in order to produce something with valued aesthetic quality.

1. 2. 1. 3 Tacit knowing

Dormer (1997) understands craft knowledge as tacit knowledge gained through experience. He insists that it can only be learned by individuals from other people through practice and first hand experience. According to Coy (1989), craftsmanship involves more than performance of an expert task. It also refers to a code of normative behaviour, often unwritten, that is expected of a craftsman. Learning this code is essential if a craft or a skill is to be practiced properly, safely and profitably (Coy, 1989).

According to Koskennurmi-Sivonen (1998), although craftspeople have always referred to tacit knowledge, its existence has only recently been proved. Tacit knowledge is discussed not only in studies of craft, but also in other fields such as business and education. The theory of tacit knowing was developed by a scientist and philosopher, Michael Polanyi, who studied it not as a form of knowledge but as a process of knowing (1973). Polanyi (1973) explained that it enables us to do something without articulating how. In his view, the tacit form does not imply something we cannot express at all verbally but something we cannot express adequately in words or only in a perfunctory

way. In other words, we never get around to putting this knowledge into words.

1. 2. 2 Justifications for craft in education

Many justifications for craft in school education have been proposed and studied were located during the review of literature. In England, at the time the research began, there has been some debate as to whether design thinking and skilled knowledge are justifications for craft education in schools but in Japan only skilled knowledge is valued.

1. 2. 2. 1 Biological

Some authors claim there is a fundamental human, biological need to engage in craft (Robertson, 1961, Dissanayake, 1988, 1992, Hamamoto, 1992). Dissanayake, an anthropologist (1988), has argued that making, in itself, is inherently pleasurable and is a critically important biological drive. Similarly, she (1988) has argued that the pleasure people feel at handling and crafting materials is related to the tool making and ceremonial functions of their ancestors and making has played an essential part in human evolutionary development. Mason and Houghton (2002) write that it is important for students to be initiated into artistic and productive technologies because they are crucial to human survival.

1. 2. 2. 2 Vocational

According to Press, in 1998, craft education in the UK was rising to the challenges of a new context, equipping students with the skills and knowledge to help build new industries. In 1998, Tufnell researched which kinds of knowledge and skills employers require in their workforce. His study found that practical skills were considered more important by teachers and employers. This research team recommended the school curriculum should give young people;

(a) The opportunity to experience making activities to assist the development of

physical skills, such as, movement, spatial perception and dexterity and the operational skills fundamental to the activity.

(b) Insight into and awareness of the operational skills which they will experience when involved in making activities and their value in the context of employability;

(c) The opportunity to experience the enjoyment, realism and purposefulness which comes from an involvement in making (Tufnell, 1998; 60).

In 2005, Houghton argued that there are vocational benefits from craft education even for 21st century workers in the UK because many jobs still require practical skills. In craft education, students learn how to work in a sequence of doing and thinking, how to solve problems and how to behave creatively.

1. 2. 2. 3 Sensory

Robertson, who is one of the few art educators to have written extensively about craft education at secondary school level, (1989) also argued that it develops intuitive thought and an understanding of the properties of materials through the refinement of touch.

> Children in the woods rubbing the tree-trunks, patting mounds of damp green moss. If we allow them this absorption, this close prolonged contact with natural materials, this sensuous immersion, then we are laying the foundations for art and craft. Because if one is going to spend hours and hours in close contact with a material, one has to love that materials if we see a person fondle a horse we know he or she loves horses. So if we encourage the refinement of touch we are educating for important aspects of life (Robertson, 1989; 241).

Referring to the education of touch, Robertson (1961) maintained that it is vital to use natural materials in schools to teach craft because, through handling them, children become more sensitive to their environment and the natural world. Also, she pointed out that, in the twentieth century, children did not have enough contact with nature and this is harmful.

Mizui who is a Japanese secondary school art teacher (1992), described people today as divorced from subjectively, actively and intentionally engaging in hand-making, and understands art education as playing a important role in development of the senses and dexterity. She is concerned that lower secondary school students are less skilled manipulating materials and tools than their parents' generation. The Japanese teachers who participated in my previous research (Sato, 2005) told me that their students in lower secondary school have very little experience of dealing with materials and tools so it was difficult to teach them specific craft skills. They valued physical dexterity in children.

1. 2. 2. 4 Psychological

According to Robertson (1961), craft is character forming because it teaches children a sense of responsibility and perseverance. When children have to take responsibility for all the processes of making a piece of craftwork, it helps to develop patience. Robertson (1952) acknowledged that participation in craft encourages pride and self-worth and there is real satisfaction in making something well, something that will last and in which each part is skilfully fashioned.

1. 2. 2. 5 Cultural

Craft can be a vehicle for expression and transmission of group, or national identity (Katter, 1995). Craft education therefore plays an important role in cultural learning, defined as understanding cultural diversity, and the construction of identity. According to Gardner,

> any culture harbours a collection of crafts … that must be mastered by at least some individuals, if the knowledge of the society is to be passed on to the next generation (1990; 28).

Katter (1995) claimed that studying crafts enables children to communicate their

histories and learn about their own culture and heritage. Mason and Houghton (2002), who pointed out that understanding past and present technologies are interconnected, consider knowledge of making in the past an important educational aim.

1. 2. 2. 6 Intellectual

According to Mason (2000), the most common rationale for craft education in the UK is that it contributes to knowledge and skills that are important in other school subjects. For example, it is argued that it develops higher order thinking skills such as problem-solving and creative thinking.

According to Garber (2002), craft learning involves imagination, creative thinking and reflection and as well as the production of objects. Pupils are challenged at all stages of a craft process to find individual solutions to practical problems. In the school subject of Design and Technology in England, crafts have been justified as providing children with an opportunity to solve problems through making (Hennessy and McCormick, 2002, Houghton, 2000). Research in secondary schools in Sweden by Borg in 2001 found that craft knowledge was acquired through solving problems. Learning a craft is a constant cycle of action and reflection.

> Initial thoughts and reasoning about the object are transformed into and considered in sketches, pictures and written text, which are then translated into actions; these actions can, in turn, result in new thoughts and reasoning (2001; 249).

Borg (2001) explains how thought and action are combined in craft activities in schools. According to Eggleston (2000), making helps children develop ideas for designs in sympathy with the properties of materials. Isaac (1986) suggested that craft lessons enable pupils to bring abstract knowledge to concrete form. Also, Baynes (1985) has argued that children learn to solve problems in a concrete way through designing and making.

Houghton (2005) mentions that craft connects practical and theoretical knowledge both of which are crucial for successful craft learning. As Borg (2001) explains;

> pupils act by coordinating mental and physical tools during the work process. What at the moment could be described as 'theoretical' at the next moment change and be regarded as 'practical' and then once again be described as 'theoretical' (Borg, 2001; 252).

Craft learning is not only about making but also about conceiving processes together. Some scholars understand evidence of the development of creativity an important outcome of learning thorough craft (Mason and Iwano, 1995, Press and Cusworth, 1998, Garber, 2002). However, Houghton (2005) points out that this fact is not widely understood.

1. 2. 3 Methods of teaching craft knowledge

1. 2. 3. 1 Apprenticeship

According to Gardner (1983), bodily kinaesthetic knowledge is typically acquired through observation, direct involvement and informal training, analogous to early non-scholastic forms of learning. Dormer (1997) has written that knowledge of craft depends on tacit knowing and is gained through hands on experience. Furthermore, it is learned by individuals through practice and from other people. While he acknowledged that books and CD-ROMs are helpful for understanding the principles of practice, the most efficient way of learning is 'face to face teaching', or apprenticeship with people who are already themselves practically knowledgeable. Similarly, Coy (1989) defines apprenticeship as the way a novice learns from an expert through observation and practice. According to Gardner (1989), there are two main types of learning in general. One is based on memorising and understanding resources, and reading and writing and the other is based on observation of expert work and practice. The training system for both artists and craftspeople in Europe during the Renaissance was apprenticeship but this model of learning slowly disappeared and is now neglected (Gardner, 1989).

In Japan, the apprenticeship system of learning how to make Buddhist statues in craft studios dates back to the Kamakura period in the fourteenth century and novice painters in *kano* schools learned from experts the studio during the Edo period (seventeenth to nineteenth centuries). Today, the training system for learning Japanese traditional arts such as instruments and dance is based on '*moho*' (imitation) where novices imitate an expert's work (Ikuta, 1987). Novices in many other Japanese crafts also learn through observing and analysing an expert's exemplary work, copying and practicing processes and are supervised in their developing work by an expert (Ikeuchi, 2000). They learn about the specific knowledge, skills and value systems of the expert that are particularly difficult to express in words. The traditional form of apprenticeship refers to learning from skilled persons, demonstration and observation (imitation and repetition), tacit and informal leaning (non-structured learning) and getting into a specific community.

1. 2. 3. 2 Situated learning

Lave and Wenger (1991) explain learning in general as requiring an interaction between experts and novices. They are especially interested in the process through which novices gradually take part in certain community activities. Novices take on new roles and responsibilities as part of their interaction with experts. For example, in a tailors' studio in Africa today, a novice starts doing easy work, which could be repaired, and moves to more skilled work, under an expert's supervision (Lave and Wenger, 1991). They call the novice's process of ongoing participation 'legitimate peripheral participation'. By legitimate they mean that novices take on a formal role in a community activity in spite of their lack of skills. Novices are understood as legitimate participants in an early stage of participation in the community activity and they use the word peripheral to refer to the level of novice's participation. In this theory, a novice takes part in a community activity little by little. Their theory helped me understand an important

aspect of craft learning namely that novices learn skills in specific cultural communities.

1. 2. 3. 3 Apprenticeship in early learning

The educational psychologist, Rogoff (1990) maintains that children are active in creating culture and also transforming cultural activities. She explains that it needed to compare the way young children and novices learn through apprenticeship. As novices, children actively attempt to understand new situations. At the same time, skilled adult partners help them with difficult problems by structuring problem solving sub-goals for them to focus their attention on manageable aspects of a given task. Rogoff mentions that 'shared problem solving (with active learners participating in culturally organized activities with more skilled partners) is central to the process of learning through apprenticeship' (1990; 39). Novice children learn to solve problems through observing skilled partners at work, by copying them and then doing it themselves. Her research interest is mainly in cognitive development in young children. However, her theories are important for craft in general education because of her emphasis on learning through apprenticeship.

1. 2. 3. 4 Issues in teaching and learning craft in schools

Robertson (1952) pointed out it is difficult to adapt the apprenticeship method to teaching and learning in schools without master craftsmen and many similar aged pupils in classrooms. As solutions for this problem, she identified a need for smaller classes where teachers can respond to students' individual needs or to have pupils of different abilities working together.

Houghton researched pupils' perspectives on craft in English and Welsh secondary schools in 2000. He found that students aged eleven - sixteen liked to learn crafts best by demonstration, as is the case in apprenticeships, however he suggested this is not

the only way to teach craft. He pointed out that craft knowledge can be a platform for other kinds of knowledge and that craftspeople often need ‘prepositional knowledge’ in their work such as knowledge of chemistry for jewelry, dyeing and ceramics.

My previous research (2005) established that students in Japanese schools liked to learn from each other. I observed not just the teacher but also students in lessons who finished their work quickly taught others who had not completed it yet. Apprenticeship does not always imply that young people learn from the elderly. The important point is that a less skilled person learns from a more skilled person by observing and doing.

1. 2. 4 Resources for teaching crafts

In this research, the term ‘resources’ includes: staff; time; accommodation; facilities; equipment; tools and materials; hardware resources (e.g. books, newspapers, magazines; posters and postcards; museums and galleries, craftspeople in residence and new technologies). Hall (1995) pointed out what is taught in schools and how it is taught are heavily influenced by the resources available to teachers and pupils and the opportunities and constraints they were faced with. The size and quality of accommodation, facilities, equipment and materials, length and frequency of lessons affect the quality of art and craft teaching. The Survey and Analysis of Published Resources for Art (5-19) by the Schools Curriculum and Assessment Authority in 1997 found that art teachers selected resources for the following reasons: their personal interest, motivation and training, accessibility and finances available (in Burgess, 2003).

In 1952, Robertson stated that there are three reasons for using ‘raw materials’ in crafts education for adolescents. One is to develop their sensitivity to quality. The second is to cultivate their perception of the material, which is an essential part of making. The third is they learn to control materials, which is exercised at every point in the making

process.

The choice of materials is important in craft teaching. In Japan, teachers often use commercial kits in craft lessons in art in schools (Sato, 2005). These are prepared sets of materials and tools ready to make art works. Sometimes, the kits include parts that have already been fixed together and use non-authentic materials (e.g. a box, Japanese lacquer). Survey research into commercial kits in Japanese lower secondary schools in 1989, found that the majority of teachers used them frequently (in Mizui, 1992). In the research about craft education at secondary schools in England and Wales by Houghton (2000), students did not comment on materials and tools but expressed dissatisfaction with the short time allocated for craft lessons and the large number of students within classes. The teachers he interviewed all stressed that craft materials, tools and equipment were very expensive to purchase and this lowered the quality of their work.

1. 3 Craft, Creativity and Design

In this part of the chapter, I present some ideas from the literature about design and creativity and teaching them. The reason why I explored craft, creativity and design together was that this research was concerned with how students develop creative ideas together with skilled making.

Design is a contested concept just like craft. Some scholars seek open definitions of it. For example, according to Victor Papanek,

> All men are designers. All that we do almost all the time, is design, for design is basic to all human activity. The planning and patterning of any act toward a desired, foreseeable and constitutes the design process. Any attempt to separate design to make it a thing by itself, works counter to the fact that design is the primary underlying matrix of life (1972; 3).

His definition supports the idea that design is important for all people. However,

according to Julier (2000) much of design history can be read as a history of individuals and groups who have striven to separate design from other commercial and cultural practices. Walker (1989) writes that design can be about ‘a process; or the result of that process; or products manufactured with the aid of a design; or the overall pattern of a product’ (23). The term design covers a wide range of quite different things including both the results of a design decision and a design activity and distinguishes design from making spontaneously. Myerson (1993) suggests that;

> design as an object fixed in time and space, has been replaced by design as a process, fluid, changing, perplexing and increasingly unable to be contained by traditional academic disciplines or methodologies (in Addison and Burgess, 2003; 179).

It was more appropriate to understand design as a process, as opposed to a final product in this study because my interest was in how to develop students’ design thinking in relation to craft.

Designing has been linked to theories of creativity where it refers to the process of generating unique/ new valuable ideas (Lewis, 2005). Lewis explains that the reason why design fosters children’s creativity is ‘its open-endedness’ (2005; 43). As he points out, in designing;

> There is more than one right answer, and more than one right method of arriving at the solution. The ill-structured character of design requires that students resort to divergent thought processes and away from the formulaic. As they do so, their creative abilities are enhanced (2005; 43).

A decision was taken at the beginning of this research to use the concept of design thinking as a framework for developing discourse on creativity. Because the general theory of creativity was too extensive the review of literature was reduced only to basic concepts of creativity and the related theories of teaching and learning as they relate to design were analyzed, as discussed below.

1. 3. 1 Creativity

1. 3. 1. 1 What is creativity?

Some researchers have investigated and identified levels of creativity (Beattie, 2000). ‘Big creativity’ occurs when something of enduring value is contributed to existing knowledge that transforms it. ‘Small creativity’ acts are more humble, through perhaps equally valuable, because they actively give fresh and lively interpretations to any endeavour (Feldman, Csikszentimihalyi and Gardner, 1994). Margaret Boden (1990, 1994) has distinguished between psychological creativity; P-creativity and historical creativity; H-creativity. She suggests that P-creativity is novel to an individuals’ mind and H-creativity is novel to the whole of human history. P-creativity could be H-creativity but this would be rare.

According to Csikszentmihalyi (1996, 1999), creativity cannot be studied without addressing the parameters of the cultural symbol system, in which the creative activities take place and the social roles and norms that regulate them. It is impossible to define or interpret the concept of creativity universally into empirical contexts because each creative domain (e.g. visual art or music) has a different value system.

Eisner (1972) has described ‘Boundary Pushing’, ‘Inventing’, ‘Boundary Breaking’ and ‘Aesthetic organizing’, levels of creativity in art education (Eisner, 1972; 217-221). He says ‘boundary pushing’, ‘inventing’ and ‘boundary breaking’ are about innovation and novelty and ‘aesthetic organizing’ is about harmonising aesthetic qualities. Boundary breaking is a very rare type of creativity which is not often seen. I found his idea of aesthetic creativity was helpful given that the research was about teaching craft in art lessons.

A growing number of people think creative thinking skills can be improved through direct

effort and attention (de Bono, 1992). Creativity was defined in the educational report, 'All Our Futures: Creativity, Culture and Education' in the UK as 'imaginative activities fashioned so as to produce outcomes that are original and of value' (DfEE, 1999; 29). The report pointed out that while it would be wonderful if a school child was the first person to discover a new scientific principle, this is highly unlikely. The socially constructed definition of creativity cannot be applied to children because they have not acquired the necessary knowledge or skills in the society. However, skilled teachers are able to help them solve problems creatively and have ideas that are new to them. The DfEE definition of creativity was found to be useful and contributed to a conceptual framework developed for this research.

After studying exceptionally creative people, Csikszentmihalyi (1996) developed a theory of 'flow', which he described how people experience a particular state of mind that yields novelty and discovery. When things are going well in creating, people work automatically and unconsciously. This condition seems to be preconditioned. He writes that people who experience 'flow' have clear goals, and are able to effect a balance between challenges and skills, merge action and awareness, and do not fear failure. He explains that the experience of 'flow' involves feedback when innovation occurs that produces enjoyment. While he could be talking about exceptionally creative people, and much could be learned through examining them, I agree with Guilford that it is important to remember that creative behaviour is not limited only to talented people (1950).

Creativity has been studied in various disciplines such as behavioural psychology. Recently, scholars have argued this theory cannot be studied from one perspective and have adopted a 'confluence approach' (Sternberg and Lubart, 1999). Amabeile (1983), for example, describes creativity as the confluence of intrinsic motivation, domain-relevant knowledge and abilities, and creativity-relevant skills such as training

and personality traits. She (1996) links the theory to a process of problem identification, preparation, response generation, response validation and communication and outcome with the opportunity for feedback. Sternberg and Lubart (1993) identified six resources needed for creativity to occur. They are intellectual abilities, knowledge, thinking styles, personality, motivation, and environment. They explain that a confluence of analytical, synthetic and practical-contextual abilities is especially important (Sternberg and Lubart, 1993, 1999).

Csikszentmihalyi's confluence theory highlights the interaction of individual, domain and field. Each domain such as a curriculum subject has a symbol system (1993, 1999). In this research, the curriculum domain is Art. A 'field' consists of 'gatekeepers' who approve what should or should not be included in a field. In this research, they are curriculum policy makers and teachers. It could be argued that it is art teachers who should establish what is creative or is not and what is acceptable as creative in this domain. Csikszentmihalyi (Ibid) explains that true creativity does not occur if it has not been accepted by a field. In short, a student's ideas will not be understood to be creative if they are not accepted by the field into the domain. The third component is individual. Individuals in this research are students who study craft in school subjects in Art and Design and Design & Technology in England and Art, Art & Handicraft, Home Economics and Technology & Home Economics in Japan. Importantly, Csikszentmihalyi (Ibid) maintains that for creativity, individuals need access to the domain and to be motivated to learn according to its rules.

According to Cropley (1997) and Csikszentmihalyi (1993, 1999), domain knowledge features are a key precondition for creativity, but they pointed out that prior knowledge in a domain can sometimes destroy creative behaviour. Although Lewis (2005) mentions

that prior experience or knowledge can depress creativity, this is not an argument against acquiring domain knowledge. He insists that schools and teachers should provide students with the basic knowledge of a domain to support their creative behaviour.

The review of theory about confluence approaches suggested it is important that teachers consider a range of factors to help them improve students' creativity. Cropley's curriculum model for fostering creativity in schools (1997) involves prioritising of content knowledge, risk taking, building intrinsic motivation, stimulating interest, building confidence and stimulating curiosity (in Lewis, 2005; 41). Although creativity is likely to occur at the interaction of the domain, field and individual, according to Lewis (2005), the significance of active interaction is mostly ignored in schools.

The learning environment is crucial. Schools can stimulate students' creativity if the school/ classroom environment facilitates risk taking, problem posing, individual learning, and thinking styles and intrinsic and extrinsic motivation (Sternberg and Lubart, 1993, Cropley, 1997). If the school environment does not reward creative behaviour, it suppresses creativity.

1. 3. 1. 2 Teaching and leaning methods for developing creative thinking

Some researchers have adapted a pragmatic approach to developing for creativity, for example, Osborn's strategy for Brainstorming (Osborn, 1953) or de Bono's Lateral thinking (de Bono, 1992). The kind of knowledge they formulate is called divergent thinking and refers to thinking that yields a variety of solutions to a given problem (Guilford, 1976).

Osborn (1953) identified the following steps in the creative thinking process: (i)

orientation; pointing out the problem, (ii) preparation; gathering pertinent data, (iii) analysis; breaking the problem down, (iv) hypothesis; piling up alternatives by way of ideas, (v) incubation; letting up, to invite illumination, (vi) synthesis; putting the pieces together and (vii) judging the resultant ideas. However, in practice people do not follow this order or sequence of steps. His strategy of brainstorming is used in group work to encourage original and spontaneous thinking and help teams of learners produce a lot of new ideas quickly. The technique hinges on the teacher creating a classroom atmosphere in which participants feel free to propose impossible solutions. People do not become creative if they are constantly criticised so at first all ideas are welcomed. Many ideas are produced some of which may prove interesting. Participants also make links between and modify existing ideas.

Edward de Bono's work did not directly address creativity but his notion of divergent thinking is considered important both for design and creativity. He proposed the idea of 'lateral thinking' (1992) to explain how novel solutions to problems are generated. The term 'lateral' refers to moving sideways or off at a tangent across the established patterns of thinking instead of moving along them sequentially (de Bono, 1992: 15). He argued that new ideas are generated this way alongside linear processes of thought. The important point is that most design problems require a different perspective to solve them successfully and divergent thinking plays an important role in this. de Bono (1982) pointed out that the way to solve a design problem is not by eliminating its cause but by designing a way forward even though the cause is still in place. He has suggested many practical strategies teachers can use in schools. For instance, the one called 'six thinking hats' in which six fundamental modes of thinking are given a hat of a different colour. Individual students are given different coloured hats (different perspectives) and then discuss problems from those different perspectives to create many ideas.

1. 3. 2 Design thinking

As explained earlier, its open-endedness makes designing particularly suited to including creativity in children. There is more than one right answer or way of arriving at a solution to a design problem. In the next section of this chapter, creativity will be investigated more closely in relation to design.

1. 3. 2. 1 Concepts of design

Thinking about design as a process, as opposed to an outcome or final product, was most appropriate for this study, as mentioned previously. Some theories explain design as planning to produce for some purpose. Papanek wrote that 'design is the conscious and intuitive effort to impose meaningful order' (1985; 4). Similarly, it is also described as 'an activity that translates an idea into a blueprint for something useful' (Design Council, 2006; 1). Morrison and Twyford (1994) wrote that design is predominantly a problem–solving activity. It is problem solving because someone conceives and plans something that does not yet exist (Buchanan, 2000).

Owen-Jackson (2002) finds it important to distinguish design domains to see what they include. For studio potters, for example, designing and making are very closely linked whereas designers of commercial products design but do not make products. He also mentions craft teachers' concern with obtaining 'finish' and 'quality' when making objects (2002; 91). If you want to teach only the process of 'designing' then notions like 'finish and quality' are less important. Making has separate aims from designing. For the purpose of being able to design, he says it is necessary that pupils are able to model all ideas appropriately to see if they are feasible (Ibid).

1. 3. 2. 2 Models of the design process

The review of literature identified several different design process models. Educators

have suggested there is a view that designing cannot be explained comprehensively. According to Archer (1974), designing is not a linear activity which begins from defining a problem, generating an idea, follows with the ideas evaluation and ends with a solution. After studying professional designers, Lawson (1980) explained designing as a subconscious process that cannot be put it into one fixed model. However, Morley (2002) writes that models of the design process can be used to highlight essential parts of the process students should know about.

A simple linear model starts with a problem and continues through a linear sequence of steps to a solution (in Morley, 2002; 15) (Figure 1. 1). One problem with this model is that it does not allow for changes of direction and another is that there is no interaction between the stages. For instance, 'evaluation' is a crucial component in the design process and does not only occur after a solution (Morley, 2002).

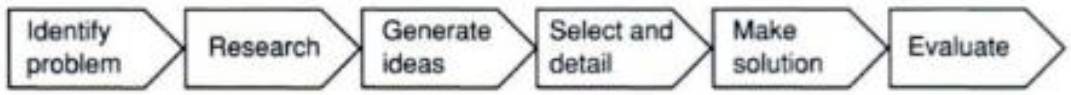


Figure 1. 1 Linier design process model. Reproduced from Kimbell, Stables, Wheeler, Wolziak and Kelly (1991; 18) with permission from HMSO (in Morley, 2002; 15)

Some models try to explain the design process as cyclic, interactive, or as a loop of phases or steps. The design process is a cyclic, interactive, circular loop of phases, including problem, research, generating ideas, selecting and making. The circular model in Fasciato (2002; 33) (Figure 1. 2) included detailing a problem, research, exploring possibilities, refining ideas, detailing a solution, planning the making, making, evaluation, detailing a problem and so on.

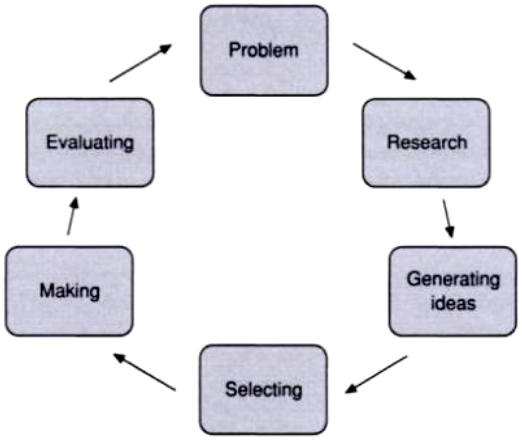


Figure 1. 2 Cyclical design process model (in Fasciato, 2002; 33)

The interactive design process model developed by Kimbell (1986) (Figure 1. 3) is more flexible and is based on the working methods of professional designers in which thought and action activities interact. The emphasis is not on an end product and new problems may be provided to start the cycle again.

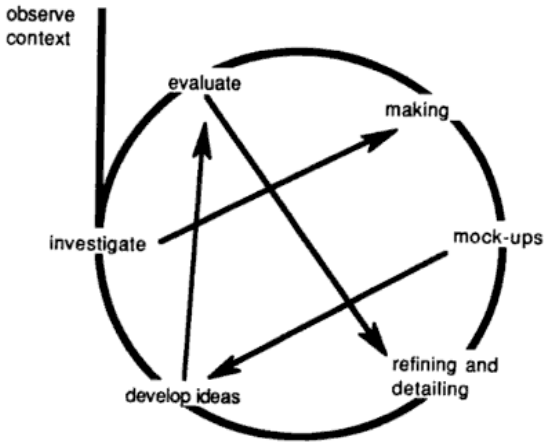


Figure 1. 3 Interactive design process model by Kimbell in 1986 (in Banks, 1994; 53)

The interaction design process model developed by the Assessment of Performance Unit (APU) (Kimbell, R., Stables, K., Wheeler, T., Wolziak, A. and Kelly, V., 1991) tries to represent the interrelationship between thinking/ reflection and the realization of a design idea (Figure. 1. 4). It shows the interaction of thinking processes and actions. It was helpful for this research because it gave me insight into how design might be taught and learnt.

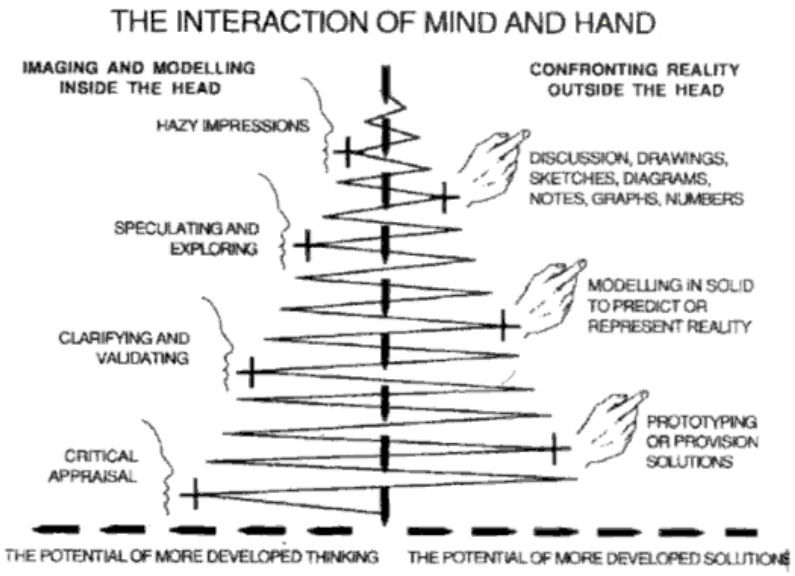


Figure 1. 4 APU model of interaction between mind and hand (Kimbell, R., Stables, K., Wheeler, T., Wolziak, A. and Kelly, V., 1991; 20)

Some design education experts write about the way skills are developed through the actual making process. According to Baynes (1985), pupils learn to solve problems in a concrete manner through designing and making together. Design is fully developed during the making process (Owen-Jackson, 2002). This theory is based on the notion of modelling ideas in the mind, or ‘thought-in action’ (Kimbell and Perry, 2001). Newton mentions that it is particularly important for pupils in primary schools to learn to develop design thinking and practical skills together.

> Design is the process of generating and developing ideas that seem likely to solve a practical problem or safety some practical need. Of course, ideas have to be turned into products before we can be sure a problem has been solved so having and developing ideas alone is not enough (Newton, 2005; 12).

Although designing and making are not the same things, many design process models developed for use in schools include making. The APU model of interaction between the mind and hand in 1991 could explain the relationship between design thinking and skilled knowledge.

1. 3. 3 Teaching design thinking

Scholars and policy makers of art and design education in Japan have pointed out that theory of teaching design is less well-developed than theory of teaching making (Ueno, 2001). This part of the chapter describes ideas about teaching design and related issues from literature in the UK. As mentioned earlier, technology teachers in Britain often follow rather a formulaic way of teaching design. Lewis (2005) claims that it goes against the natural design tendencies of children. He says that this tendency to teach design through a process, which has definable stages, is also followed in the United States.

1. 3. 3. 1 Stages in the design process

The design process models developed by educators in the UK have some commonalities. These all refer to identifying a problem, investigating it, specifying and generating solutions, and evaluating them (Hennessy and McCormick, 2002). These models have been developed specifically for one particular school subject, Design and Technology. I could not find any discussion about stages in the design processes or related teaching strategies in Japan. In this section, therefore, theories investigated in the UK are described in more depth.

Owen-Jackson (2002) explains that ‘identifying a problem’ includes identifying and describing it precisely together with a context for it. Once the problem is identified clearly, an investigation into possible solutions and problems can be carried out. Issues that may affect the solutions must be made clear; for examples, of size, cost, materials and tools and methods. This investigation also includes gathering information about possible materials, methods and users. Owen-Jackson (Ibid) points out that these sorts of investigation should lead to a specification but could occur at any stage of the design

process.

‘Specification’ offers an acceptable solution and provides the criteria for evaluation of a design (Ibid). For instance, they should include cost, the client’s needs and intended results. Depending on the product, there are many ways of creating specification. Owen-Jackson (Ibid) suggests that teachers should check if a student’s specification includes appropriate details and is referred to throughout the designing, making and in the final evaluation.

Owen-Jackson (Ibid) explains that students create solutions by generating ideas that might solve a problem, choosing a certain one, developing it into a practical solution and testing it. However, a problem occurs in teaching this stage of design. Although school teachers often ask their students to create more than one idea for a solution to a problem, they do not understand why this is important. It is crucial students understand why they are asked to generate many ideas and evaluate them against a specification before they select the most appropriate one (Owen-Jackson, 2002).

According to Rutland (2005), the early stage of generating ideas must be divergent in the sense that not too much emphasis should be placed on checking if they are all feasible. Whereas this may not result in a practical outcome it is helpful if students can think of possible solutions without fear of making mistakes. Brainstorming is one way of encouraging the generation of ideas. Encouragement also makes for a good classroom atmosphere in which students can create many ideas without being criticised (Ibid).

The literature suggested that it is important that teachers help students try out their own ideas using appropriate materials and processes. Craftspeople often develop their designs from direct involvement with the materials used for a final product rather than by

drawing ideas on paper before they start. So, skilled knowledge as practical knowledge of materials and tools and controlling own body may also be a necessary knowledge to help students develop ideas.

It is generally agreed in the design education literature that evaluation is not something that should only be done at the end of project but is part of an on-going design process (Baynes, 1985, Owen-Jackson, 2002, Newton, 2005). The common point for any evaluation is understood to be comparison with the specification after a problem has been identified and before it has been determined (Owen-Jackson, 2002).

According to Rutland (2005), students in schools frequently decide too early and become ‘fixed’ on one particular solution. Students in schools are not ‘experienced’ professional designers with a wide range of expertise. They may become confused about how to understand a problem or generate its solution.

Although these stages in the design process were located in Design and Technology literature, they might be useful for teaching design thinking in craft lessons in Art in Japan. Since students are novice designers, it would be crucial for Art teachers to understand and teach each design stage interactively and flexibly to enable students to develop their design ideas.

1. 3. 3. 2 Problem-solving

Morrison and Twyford (1994), Buchanan (2000) and Owen-Jackson (2002) all define design as a sort of problem-solving activity. Hennessy and McCormick (2002) have discussed methods of teaching problem-solving in Design and Technology. They have explained that students should learn about certain sub-processes. The development and realization of a product constitutes design problem-solving because generating a

range of ideas requires ‘critical and creative thinking’ to fit the criteria (Rutland, 2001; 50).

According to Row (1987) and Mioduser and Kipperman (2002), problem solving involves a wide range of cognitive and meta-cognitive processes such as invention, exploration, experimentation and reflection on action. Hennessy and McCormick, (2002) explain that students have to be able to think about their thinking during problem solving. Continually asking students questions about what they are doing or what they are trying to accomplish ultimately leads to their internalisation thereby improves their problem-solving ability (Ibid).

In a design activity all the design stages of designing: researching; specification; generating ideas; solution and evaluation are carried out interactively. However, if students always work through all these routine stages, they may not have time to learn any specific one in-depth. According to Hennessy and McCormick (2002), design and making cannot be understood by focusing on specific sub-processes and this is what makes it difficult for students to acquire design process skills. Owen-Jackson (2002) suggests that most teachers in Design and Technology in Britain use a combination of holistic and focused projects. He also explains that in the focused tasks, teachers tend to teach particular craft skills or knowledge rather than design stages.

One finding from the review of literature on design education was that it is important to set problem-solving activities in contexts that are meaningful for students (Hennessy and McCormick, 2002, Owen-Jackson, 2002). Both novices and experts use domain specific methods for solving-problems related to a familiar context in similar ways. According to Owen-Jackson, it is important that students solve ‘problems they have some stake in, or ownership of’, although producing this sort of ‘meaning’ and ‘reality’ is

difficult in schools (2002; 99). A suggested approach in Design and Technology is to give children a clear design brief to produce a commercial product (Ibid). In other words, it is important that teachers relate design tasks to real or tangible companies. Another is to discuss possible tasks with students that respond to their individual needs (Ibid); for example, students could discuss products they need at home, such as a bookstand or CD case.

Although it appears that many forms of problem solving in everyday life require context-specific forms of competence, there is some evidence that general problem-solving strategies play an important role in design education (Hennessy and McCormick, 2002). Recent studies in mathematics and language education have recommended 'cognitive apprenticeship programmes' are set up provide students with opportunities to observe and engage in expert's working strategies in context (Palincsar and Brown, 1984, Schoenfeld, 1985 in Hennessy and McCormick, 2002; 103). In schools, teachers could act as role models for students when solving unfamiliar problems. Cognitive apprenticeship requires students to be able to work with and observe skilled people carrying out problem-solving activities. However, Hennessy and McCormick (2002) point out that in practise most Design and Technology teachers demonstrate a few particular skills but do not model problem-solving strategies. Professional designers work in collaborative groups, so learning through apprenticeship may take place in this way.

1. 3. 3. 3 Reflective practice

Many scholars emphasise the role of 'reflection on experience' in design thinking (Hennessy and McCormick, 2002, Owen-Jackson, 2002). Amulya (2004) describes reflection as an active process of examining one's own experience.

By developing the ability to explore and be curious about our own experience

> and actions, we suddenly open up the possibilities of purposeful learning –derived not from books or experts, but from our work and our lives (Amulya, 2004; 1).

Elliot (1991) explains reflective practice in more detail as it to relates learning activities.

> Learning to be a reflective practitioner is learning to reflect about one's experience of complex human situations holistically. It is always a form of experimental learning. The outcome of such learning is not knowledge stored in memory in propositional form, but holistic understandings of particular situations which are stored in memory as case repertories. (Elliot, 1991; 313)

The theory of the reflective practitioner as proposed by Donald Schön (1983) distinguishes between three types of reflection: reflection-in-action, reflection-on-action and reflection on reflection-on-action. He explains that;

> Reflection-in action is a process we can deliver without being able to say what we are doing. Skilful improvisers often become tongue-tied or give obviously inadequate accounts when asked to say what they do. Clearly, it is one thing to be able to reflect-in-action and quite another to be able to reflection-in-action so as to produce a good verbal description of it; and it is still another thing to be able to reflect on the resulting description (1983; 31).

According to Amulya (2004), certain sorts of experience produce opportunities for learning through reflection. For example, refection on the experience of 'uncertainty' helps to 'shed light on areas where an approach to our work is not fully specified' (Ibid, 2004; 1). 'Breakthroughs in action and thinking' are helpful in showing learners what has been learned (Ibid, 2004; 1).

The importance of reflecting on what you are doing as part of the learning process is emphasised by many scholars. Schön (1983) suggested that the capacity to reflect on action so as to engage in a process of continuous learning is a key characteristic of professional practice. Development of the capacity to reflect in and on action has become an important goal of professional training in a wide range of disciplines. Encouraging it is a particularly important aspect of the teacher's role. It can be argued that reflective practice always requires another person in the form of mentor who asks

appropriate questions to ensure reflection goes somewhere and does not get bogged down in self-judgement (Schön, 1983).

1. 4 Key findings for the research

All cultures have crafts mastered by individuals that are passed on from one generation to the next. Skilled knowledge is crucial to facilitate concrete learning achievements and is valued highly by teachers and students in British schools. Craftsmanship presents when skilled knowledge is used to solve new or unfamiliar problems with the intention of producing excellence. Many justifications for craft in education emphasised its value for refining students' motor skills.

The most efficient way of learning crafts is through apprenticeship. Identified characteristics of apprenticeship are learning from experts and through demonstration and observation (imitation and practice), tacit and informal (unstructured) learning and getting inside a specific cultural community. The quality of materials and tools available in schools is important in this regard. Commercial kits are often used in Japanese secondary schools. Research in England has found, however, that this makes students produce lower quality work.

A decision was taken to use creativity as a framework for discourse on design thinking in this research. The psychological conditions necessary for creativity to occur are that learners have to have clear goals, be able to effect a balance between challenges and skills, reflect in action and not fear failure. The combined effects of personality, intelligence, thinking skills, socio-cultural factors, motivation and school/ classroom environment are considered to influence creativity. In short, teachers need to pay attention to internal and external factors of attaching the creative process.

Although domain knowledge features are a key precondition for producing creative work they may also suppress creative behaviour. Understanding skilled knowledge and design thinking as a key element for creative work, it was important to explore what subject domains included in each school subject in the two countries, and how they influenced craft learning. This is for examining the best way of teaching design thinking and skilled knowledge in craft education.

In this research, design thinking is defined as a mode of thinking in which people generate and develop their own ideas for making objects and creativity and design are understood to overlap. In schools, flexible and interactive design processes are valued for the purpose of developing creativity. Also, it is assumed that design competence is developed through making. In design thinking processes, facilitating a concrete solution to a problem understood as a crucial stage before a design idea are realised.

The literature suggests school students are merely novice designers and teachers should take into account the following points in teaching design. Firstly, they should spell out design tasks to students clearly and check what they are making of them. Secondly, it is important they teach the design process and that students understand each stage of the design process in-depth. Thirdly, teachers need to find a balance between subject matter knowledge and general problem-solving strategies. Finally, they must stress the importance of ‘reflection on own experience’ in design thinking, which is called reflective practise. Cognitive apprenticeships understood as a way of learning problem solving provide students with opportunities to observe and engage in an expert’s working strategies in context. The apprenticeship mode of learning is important because it combines acquiring skilled knowledge with design thinking. In short, their relationship is complentary because the concepts of craft, creativity and design all require both skilled knowledge and design thinking.

CHAPTER 2
RESEARCH METHODOLOGY AND DESIGN

2. 1 Introduction

This chapter explains the choice of methodology used in this research, the plan of action and choice of schools and teachers, and methods of data collection and analysis. It also refers to validity and reliability, and ethical considerations. The empirical part of this research was carried out in England between February and July 2006 and in Japan between November 2006 and April 2007. Policy and school documents were collected and analysed during and after the empirical research.

2. 2 Choice of Methodology

2. 2. 1 Qualitative research

This study followed a qualitative paradigm and sought detailed information about how teachers encouraged children to develop and evaluate creative design ideas, become skilled users of tools and materials, and accumulate knowledge of and expertise in specific kinds of craft processes and techniques. The main reason for the choice of qualitative research method was that it would allow me to carry out inquiry myself in school settings and make use of things that naturally occur as research data (Creswell, 2003, Robson, 2003). This enabled me to investigate teaching and learning in detail in schools and to be involved in direct experience of craft activities of the teachers and learners. Moreover, some quantitative data about specialist art teachers' perceptions of teaching crafts in England and Japan had already been gained in previous investigations. Building on this information using a qualitative research paradigm seemed appropriate.

2. 2. 2 Multiple method approach

The research design evolved over time. The first proposed methodology was case study because this enables researchers to observe complex processes of craft teaching and learning directly and in-depth in real life settings. The choice of case studies for research makes it possible to develop detailed, intensive knowledge about a single case, or of a small number of related cases (Bell, 1999, Robson, 2003). Case studies have the characteristic of 'significance rather than frequency', and this offers researchers 'an insight into the real dynamics of situations and people' (Cohen, Manion and Morrison, 2003; 185).

At the beginning of the research, *Making It Work* was identified as a case for study. *Making It Work* was a craft curriculum development project initiated and funded in 1999 by the Arts Council of England and National Society for Education in Art and Design as part of a strategic plan to develop an infrastructure for craft and craft education in Britain (Mason, 2004). It was an appropriate programme for this study because it was funded and conducted nationally, took the form of experimental craft projects in schools and was aimed at improving and developing craft education in general. In January 2006 the director agreed that I could study *Making It Work* projects. However, the project did not acquire any grants at the time I was planning to study it.

Accordingly, at this point, the research design had to be reconsidered. I tried contacting schools that I was informed carried out high quality craft teaching in Art & Design and Design & Technology in order to conduct case studies of craft projects. These schools were recommended by art educators and identified in inspectors' reports. Although emails and letters were sent to the recommended schools, only one school responded in May 2006. It was difficult for an outsider to make contact with schools by themselves

and get access for in-depth studies.

At this time, I considered whether the ethnographic method was appropriate. Ethnography focuses on 'the description and interpretation of the culture and social structure of a social group' (Robson, 2003; 178). However, my research was not about understanding the culture of craft education holistically. It inquired into a specific aspect of craft teaching that is the relationship between design thinking and skilled knowledge. Additionally, ethnographers believe that social reality is understood through participation in a social group (Pring, 2000). They take a long time to collect data and the researcher is supposed 'to go native' (Pring, 2000, Bryman, 2001, Robson, 2003). I realised it would not be possible to conduct this style of research considering the time allowed for this study and access to schools.

The British Educational Research Association states that there is no one strategy that is appropriate for every research undertaken and it is about a matter of 'fitting the method or technique to what is being investigated' (in Campbell, Freedman, Boulter and Kirkwood, 2003; 5). Qualitative researchers employ data collection instruments such as open-ended observations, interviews, and documents including both text and images, that are 'interactive and humanistic'. According to Creswell, Qualitative research increasingly involves sensitivity to participants and seeks to 'build rapport and credibility' with the participants in the study (2003; 181).

2. 2. 3 Comparative education research

Right from the start, I decided to conduct comparative research. According to Bray (2007), recent understanding of comparative education is that it is not discipline but a 'field' in which researchers use tools and perspectives from other areas to focus on 'educational issues in a comparative context' (35). He also mentions that many

researchers who conduct comparative educational studies find ‘not only that they learn more about other cultures and societies but also that they learn more about their own’ (37). This fitted the original idea of this research that study in England would help me consider and conceptualise issues in craft education in Japan given that there was little scientific research on this topic in Japan. With this in mind I hoped a comparative study would give me insight into craft education in England and at the same time broaden my understanding of craft education in Japan.

Bray, Adamson and Mason (2007) have distinguished between some models for comparative education research. One model compares education in two places in a single country and the other between two countries. One example included in a book edited by Bray and Koo (2004) was a comparison of education in Hong Kong and Macao. The focus on two countries only allows for extensive depth analysis.

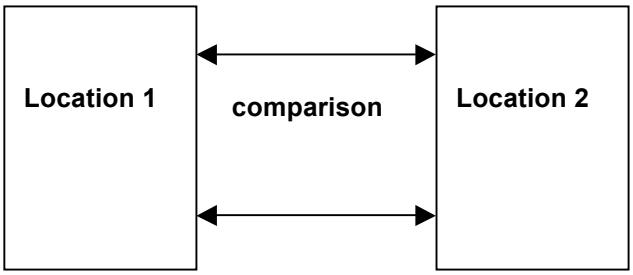


Figure 2. 1 Two-location comparative study (Bray, Adamson and Mason, 2007; 364)

An alternative model focuses on education in one location at the centre of analysis and makes comparisons as fitting with other locations. The example presented was research focused on the transition from the British colonial era in Hong Kong to China and this was compared with transitions in other colonies such as Fiji, Nigeria and Singapore. The data on Hong Kong was detailed but thin on the other systems. This model gave me the idea that I could study one location in more depth rather than study all locations to the same degree.

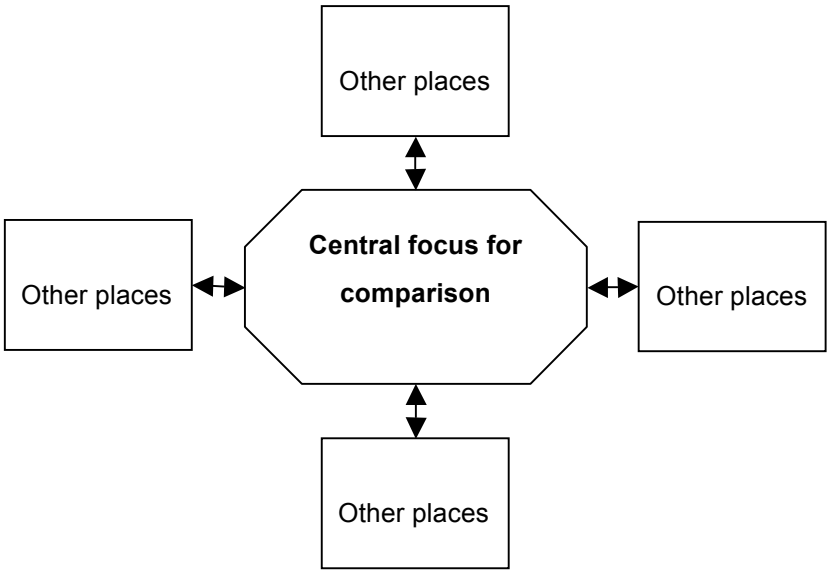


Figure 2. 2 Comparative study with a single location in the centre (Bray et al., 2007; 365)

Bray et al. (2007) conclude that the choice of model for comparative research is mainly determined by available resources, including people and budgets and also by considerations of breadth versus depth. This study aimed at in-depth research in both England and Japan. However, because it was difficult to gain access to schools in England, there was only a short period for fieldwork research, one researcher and limited budget, this comparison of craft education between England and Japan was weighed more toward findings for Japan.

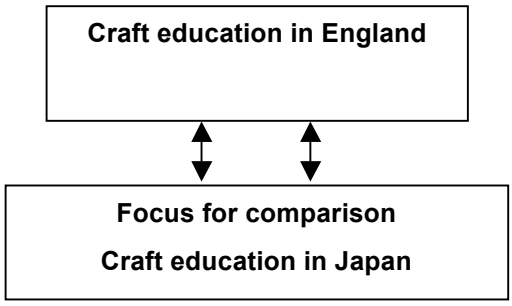


Figure 2. 3 Comparison as used in this research

According to Fairbrother (2007), qualitative researchers doing comparative education share a strong brief in the importance of cultural, political and social contexts, and adopt the position that education cannot be de-contextualised from local culture. With regard

to the question of objectivity, they draw attention to the need for sensitivity to the greater potential for bias and unquestioned assumptions when researchers work outside their own cultural contexts. An effort must be made to become conscious of such biases and to question ones' own assumptions while trying to understand those embedded in the societies and cultures which are the targets of research.

2. 2. 4 Languages

One problem was that I could not always find appropriate Japanese terms for English ones and vice versa, and because the cultural contexts were so different and some words were used in different ways. Terminology associated with art is not clearly defined in Japan. Therefore, a priority was to define their meanings more clearly for the research. An example is the term '*hyogen*' in the Japanese Course of Study for Art, which can be translated as 'expression' in English. However, it is used to describe all 'making activities' in art lessons in Japan including painting, sculpture, design and craft.

2. 3 Design of Research

2. 3. 1 Plan of action

I conducted the research in England first and then in Japan. The reason for this was I wanted to enhance my understanding of theories of design thinking and skilled knowledge as they applied to craft education in schools. The empirical part of this research was carried out in England between February and July 2006 and in Japan between November 2006 and April 2007. Policy documents were collected and analysed during and after the empirical research.

The original action plan for the research included in the research proposal submitted in 2005 is below. The anticipated completion date was April 2008 because I had registered as an MPhil course student. However, insufficient time was allocated for the review of

literature, document analysis, fieldwork in both countries, and comparative data analysis and this delayed the end date.

Table 2. 1 Original action plan

Time	Action Plan	Place
Dec 05	Research proposal accepted	UK
Dec 05 - Jan 06	Design of observation checklist and interview checklists	UK
Nov. 05 - Feb 06	Review of literature	UK
Feb 06	Pilot studies of observation and interview/ instrument revisions	UK
April 06 –July 06	Research in England	UK
August 06	Analysis of data gathered in England	JPN
Sep. 06 – March 07	Research in Japan	JPN
April - July 07	Analysis of data gathered in Japan	UK
July - Sep 07	Synthesis findings and writing up thesis	UK
April 08	Complete thesis	UK

2. 3. 2 Sampling

I studied both primary and lower secondary education in England and Japan because I wanted to know what craft education was like for the different age groups in compulsory education. Also, my preliminary study identified that craft activities had different names in the art curriculum for Japanese primary and secondary schools. *Kogei* translated as craft and *kosaku* translated as handicraft. However, time was limited so I could only study the upper years of primary school. It is important to note that the period of compulsory education and age groups in the two countries differed. So, the Year groups I studied in England and Japan did not match exactly (Tables 2. 2 and 2. 3). In England, I studied craft projects developed for students in Years 5 to 11 aged from nine to sixteen years old (Key Stages 2, 3 and 4). In Japan, I studied craft projects developed for students in Years 5 & 6 at primary school level and Years 1, 2 & 3 at secondary level aged from 10 to 15 years old.

Table 2. 2 English school education system

	Years	Student ages
Primary level	1-3	5-7
	4-6	7-11
Secondary level	7-9	11-14
	10 & 11	14-16

Table 2. 3 Japanese school education system

	Years	Students ages
Primary level	1, 2	6-8
	3, 4	8-10
	5, 6	10-12
Secondary level	1	12-13
	2	13-14
	3	14-15

I studied craft making in six school subjects in the two countries in total because preliminary research identified that skilled knowledge were central in them all (Table 4. 4). In England, I studied the subjects of Art & Design and Design & Technology in both primary and secondary schools. In Japan, I studied Art & Handicraft and Home Economics in primary schools and Art and Technology & Home Economics in secondary schools. However, for two of these subjects (Home Economics and Technology & Home Economics) I only studied the policy documents because it only became apparent they were important as I was doing the fieldwork in Japan. This will be explained in detail in Chapter 4.

Table 2. 4 School subjects studied in England and Japan

	England	Japan
Primary school level	Art & Design Design & Technology	Art & Handicraft Home Economics
Secondary school level	Art & Design Design & Technology	Art Technology & Home Economics

I studied in schools located in London and Kent in England and Tokyo and Kanagawa in Japan because it was possible for me to stay in these places and conduct fieldwork.

The main aim of this research was to study ‘good craft projects’ in order to identify the best ways of teaching design thinking and skilled knowledge together. I wrote about ten letters to local schools in South West London, which provided good quality art lessons,

according to the Office for Standards in Education, Children's Services and Skills' reports, but did not get any response. At the same time, three lecturers in Art & Design and Design & Technology teacher training in Roehampton University introduced me to teachers who conducted good craft projects. Those lecturers knew which teachers were keen on teaching crafts and had good teaching skills because they regularly visited schools to observe student teachers. When I attended a craft conference in England, I asked a teacher who presented his school's innovative craft projects to take part in my research. However, the number of schools was still not enough and I only could organise visits to them for a few days at a time because of school schedules. Throughout the study I had to keep looking for other opportunities to visit schools. When I offered to do workshops about Japanese paper craft, two secondary schools accepted (05/07/06, 18/07/06). As a consequence, I only visited three primary schools and five secondary schools in London and Kent (Table 2. 5).

Table 2. 5 Participant schools in England

School Code	Basic information about schools	Location
Primary schools		
E1	State primary school. Approximately 500 students between the ages of 5-11.	London
E2	Private school. Approximately 386 students between the ages of 4 and 13.	London
E3	State primary school. Approximately 400 students between the ages of 5-11.	London
Secondary schools		
E4	State girls secondary school. Approximately1,600 students between the ages of 11-19. Technology college.	London
E5	State boys technology college. Approximately1,400 students between the ages of 11-19. Technology college.	Kent
E6	State girls secondary school. Approximately1,600 students between the ages of 11-18.	London
E7	State mixed school. Approximately1,600 students between the ages of 11-18.	London
E8	State mixed school. Approximately1000 students between the ages of 11-19. Art college status.	London

In Japan, a lecturer in art education in Seishin University in Tokyo introduced me to a skilled art teacher in a primary school. Also, a primary school vice-principal, who worked

for the Board of Education, introduced me to a secondary school art teacher. They belonged to a school art teachers' association in Tokyo, so they knew art teachers who were good at teaching craft. They introduced me to two skilled teachers who they thought might be suitable for my research. Therefore, in Japan, I conducted research in a total seven primary schools and six secondary schools (Table 2. 6).

Table 2. 6 Participant schools in Japan

School code	Basic information about school	Location
Primary schools		
J1	State primary school. Approximately 170 boys and girls between the ages of 6 and 12.	Tokyo
J2	State primary school. Approximately 500 boys and girls between the ages of 6 and 12.	Tokyo
J3	State primary school. Approximately 400 boys and girls between the ages of 6 and 12.	Tokyo
J4	State primary school. Approximately 500 boys and girls between the ages of 6 and 12.	Tokyo
J5	State primary school. Approximately 300 boys and girls between the ages of 6 and 12.	Tokyo
J6	State primary school. Approximately 400 students between the ages of 6 and 12.	Tokyo
J7	State primary school. Approximately 500 boys and girls between the ages of 6 and 12.	Tokyo
Secondary school		
J8	State lower secondary school. Approximately 200 boys and girls between the ages of 12 and 15.	Tokyo
J9	State lower secondary school. Approximately 200 boys and girls between the ages of 12 and 15.	Tokyo
J10	National lower secondary school. Approximately 500 boys and girls between the ages of 12 and 15.	Tokyo
J11	Private lower girl secondary school. Approximately 600 girls between the ages of 12 and 15.	Tokyo
J12	State lower secondary school. Approximately 250 boys and girls between the ages of 12 and 15.	Kanagawa
J13	State lower secondary school. Approximately 150 boys and girls between the ages of 12 and 15.	Kanagawa

There were twenty-two participant teachers in England and eleven participant teachers in Japan. While there were several teachers in one department in secondary schools in England, there was only one teacher in Japan.

Table 2. 7 Participant teachers in England

Teacher code	School code	School subject	Sex
Primary school teachers			
EA	E1	General	F
EB		General	F
EC		General	F
ED	E2	A&D	F
EE		D&T	F
EF	E3	General	F
Secondary school teachers			
EG	E4	A&D	F
EH		A&D	F
EI		A&D	F
EJ		A&D	M
EK	E5	A&D	F
EL		A&D	F
EM		A&D	M
EN		D&T	F
EO	E6	A&D	M
EP		D&T	M
EQ		D&T	M
ER		D&T	F
ES		D&T	F
ET		D&T	F
EU	E7	A&D	F
EV	E8	D&T	M

(A&D=Art & Design, D&T= Design & Technology)

Table 2. 8 Participant teachers in Japan

Teacher code	School code	School subject	Sex
Primary school teachers			
JA	J1	Art & Handicraft	M
JB	J2	Art & Handicraft	M
JC	J3	Art & Handicraft	F
JD	J4	Art & Handicraft	M
JE	J5	Art & Handicraft	M
Secondary school teachers			
JF	J8	Art	M
JG	J9	Art	M
JH	J10	Art	M
JI	J11	Art	M
JJ	J12	Art	M
JK	J13	Art	M

In England and Japan, I interviewed a total of eighteen teachers. They taught in the schools I visited. In England I visited each school for only a day and interviewed the teachers during this visit. I interviewed two primary school teachers (one Art & Design and one Design & Technology teacher) and eight secondary school teachers (four Art &

Design and four Design & Technology teachers) (Table 2. 9). The two primary school teachers I interviewed were specialist trained teachers, which is unusual in England. I learned that in primary schools in England generalist teachers nearly always teach Art & Design and Design & Technology but in this case, the teachers were specialist trained because the school was private. Also, I was surprised to find there were several teachers with different specialisms and technicians in each department in the secondary schools.

Table 2. 9 Teachers interviewed in England

Teacher code	School code	School subject	Sex	Teaching experience	Specialism
Primary schools					
ED	E2	A&D	F	12	Fine art
EE	E2	D& T	F	7	Jewellery
Secondary schools					
EG	E4	A&D	F	4	Textiles
EK	E5	A&D	F	4	Photography
EO	E6	A&D	M	10	Fine art
EP	E6	D& T	M	8	Product design
EQ	E6	D& T	M	1	Architecture
ER	E6	D& T	F	9	Textiles
EU	E7	A&D	F	3	Textiles
EV	E8	D& T	M	8	Graphic design

In Japan, I interviewed four primary school specialist art teachers and four secondary school specialist art teachers (Table 2. 10). Unlike England, every state primary school in Tokyo has a specialist art teacher.

Table 2. 10 Teachers interviewed in Japan

Teacher code	School code	Teaching subject	Sex	Teaching experience	Specialism
Primary schools					
JA	J1	Art & Handicraft	M	30	Art education
JB	J2	Art & Handicraft	M	35	Education
JC	J3	Art & Handicraft	F	5	Fine art
JD	J4	Art & Handicraft	M	12	Fine art
Secondary schools					
JF	J8	Art	M	23	Fine art
JG	J9	Art	M	3	Fine art
JH	J10	Art	M	31	Art education
JI	J11	Art	M	23	Art education

2. 4 Methods of data collection

The main data collection instruments in England and Japan were educational policy document analysis, observations of craft projects in schools and interviews with teachers.

2. 4. 1 Document analysis

Document analysis was conducted in order to understand policy makers' intentions for craft education in schools. In this research, the term document analysis refers to a qualitative way of analysing documents and texts, which was understood as interpretive (Krippendorff, 2004). It was distinguished from a review of literature because document analysis involves the study of carefully selected primary resources only. One advantage of document analysis is that when it is difficult to access individuals or settings, written documents provide insight into what they do and think (Bryman, 2001, Robson, 2003). In this research, it enabled me to find out how craft education was understood broadly in England and Japan and compare policy and practice.

The specific aims for the document analysis were to establish: (i) how the term 'craft' was understood and defined; (ii) the aims of craft education; (iii) how skilled knowledge and design thinking was understood and defined; (iv) the kinds of crafts recommended; (v) teaching strategies for design thinking and skilled knowledge and (vi) assessment criteria for craft projects. The official documents chosen for analysis in England were the National Curricula for Art & Design and for Design & Technology, schemes of work for these two subjects, National Examination syllabuses and reports produced by the Office for Standards in Education, Children's Services and Skills (see Chapter 3). In Japan, they were: the Courses of Study for Art & Handicrafts; Art, Home Economics, and Technology &Home Economics; authorized textbooks for these four subjects; a document about improvements to *Shidouyouroku* (instructions about assessment

records for schools) (see Chapter 4). Other documents were gathered in schools that helped me understand how the teachers planned craft projects in schools. In England, these included examples of lesson plans and assessment criteria and procedures for Key Stage 3 and General Certificate of Secondary Education courses. In Japan, they included Year plans and examples of plans for craft projects together with assessment criteria and class handouts. However, the majority of the teachers in this research did not give me the school documents I asked for. Unfortunately, no documents were recovered from primary schools in England.

2. 4. 2 Observations

Non-participant observation was chosen as the main data collection instrument during the fieldwork to enable me to gather visual and verbal data in real life settings at first hand (Anderson, 1990, Robson, 2003). It is an appropriate method for studying craft education practice which emphasises an apprenticeship model of learning and/ or earning through doing (Robertson, 1962, Dormer, 1997).

As tools for recording the observations, I used two checklists, a notebook and a digital camera. Two kinds of checklists were developed and used to help me record what I observed in schools. The items included in the checklists were formulated with the research questions in mind. The first checklist was used to collect information about the Art department I visited and the second was used to record what I observed during craft lessons (Appendices I and II). The first one listed four items for me to check: (i) the teaching environment (e.g. number of rooms); (ii) staff (e.g. number of teachers in the department and technicians and details of their professional backgrounds); (iii) curriculum documents (e.g. lesson plans) and (iv) there was a space for miscellaneous notes. The second checklist listed seven items for me to observe and record: (i) the learning environment (e.g. display such as posters or photos of artist work); (ii)

specialist materials and tools; (iii) teaching resources; (iv) teaching and learning activities such as teacher demonstration (particularly for teaching design thinking and skilled knowledge); (v) teacher student interaction; (vi) the way the students leaning was being evaluated and; (ix) there was a space for making miscellaneous notes. Although I had intended to write note directly on the checklists directly by hand, I found it difficult to do this because I could not find the right place to write them in the checklist quickly and there was not enough space on the pages. Therefore, during classroom observations, I used items in the checklists to help me record my observations in a notebook.

I used photography also to document the learning environments, resources, materials, tools and equipment, their respective uses, student work, and different phases of craft production visually. The photographs helped me to remember, reflect on and study details later that might have been ignored had they not been recorded visually and to record the development of craft work systematically over time. It was difficult to write everything down in the notebook in the short time I was in school, and the camera helped me to documents visual data like student sketchbooks quickly.

I conducted a pilot study using the checklists and notebooks and practiced taking photographs before I implemented the fieldwork in England. For the pilot study, I observed one session of a teacher-training course in Design & Technology at Roehampton University involving a teacher-training lecturer and thirteen student teachers from diverse cultural backgrounds (21/10/05). As I had little experience of observing lessons at the time in England I was concerned about whether I would be able to understand their English. The lesson focus was on how to make toys out of paper. During the observation, I realized I was not collecting enough detailed information about teaching skilled knowledge and design thinking and experienced

difficulty playing the role of observer. Instead I behaved like a student when I listened to the lecturer. I recorded what he said but did not pay enough attention to the teaching methods or students' behaviour. Additionally, I found it was difficult to take photographs and notes at the same time. When I wrote down notes, I forgot to take photographs and regretted this many times. I realized I needed to take more care timing the photographs and note taking.

In England, the teachers seemed pleased to have me in their department for one day. I felt rather like a Japanese tourist and worried about whether or not I could gather enough data for the research in such as short time. So, I also visited some art exhibitions at the schools and talked to teachers and students there. Although I admit they were rather superficial, the one-day school visits gave me a lot of insights into craft education in these schools. From this situation, I learned about the importance of researcher flexibility.

2. 4. 3 Interviews

According to Anderson (1990), interviews are helpful to clarify observations. I chose a semi-structured method because this enables researchers to change the order of questions based upon interviewees' perceptions of what seems most appropriate at a given moment and to modify question wording and offer explanations while they are taking place. The main aim of the interviews with teachers in England and Japan was to find out about their experience of teaching craft in schools, their conceptions of craft, teaching methods for skilled knowledge and design thinking, and assessment methods for craft projects, so that I could compare practice and policy.

I developed interview schedules for the teachers in Japan and England considering research questions (Appendix IV and V). I designed the schedule for teachers in

England first. This included nine open-end questions organised into topics (i) definitions of craft; (ii) kinds of crafts taught; (iii) similarities and differences between craft projects in Art & Design and Design & Technology; (iv) teachers' thoughts on distinctive benefits of including craft activities in school subjects; (v) their strategies for teaching design thinking and skilled knowledge in craft lesson projects; (vi) use of artist residences and (viii) assessment methods and criteria. I tested this schedule with a PhD student with experience of teaching art in higher education before I actually used it in schools. She understood most but not all of the questions. I decided to add prompts to help interviewees respond more easily. However, I did not feel confident enough to make prompts spontaneously. So, I prepared them in advance and listed them under the relevant items. One example was;

> 9. What methods do you use to assess students' craftwork?
> *Prompts: how many stages are there? What methods do you use? Where do the criteria come from?*

When I was conducting the interviews in England, I realized the question 'What is the best way of combining the development of design ideas and craft skills in craft education?' was too direct. As a result, the teachers were not able to talk about it.

The interview schedule for Japanese teachers was designed after I completed the fieldwork in England. I translated the schedule into Japanese as accurately as possible. However, I changed the words 'making' to *monozukuri* and 'craft' to *kogei* and *kosaku*. Because there are no appropriate terms for 'design thinking' or 'skilled knowledge' in Japanese, I translated English explanations of them. When research takes place in two or more countries, 'definitions and meanings' are very important but can also be very confusing. One question about the differences between craft projects in Design & Technology and Art & Design had to be removed. I replaced a question about working with craftspeople in relation to teaching and professional development with one about

whether they have any experience of working with craftspeople because I knew Japanese teachers do not work with craftspeople. I tested the schedule with a Japanese art teacher in a primary school who had five years teaching experience (20/12/2006). She told me the questions were difficult to understand and some of the Japanese terms were not appropriate for teachers; for example, *houhou* (methods) is not used in schools and *tedate* is more common. She was especially concerned that the questions about teaching design thinking and skilled knowledge were too difficult. On reflection, they may have been too theoretical and too direct, and were a new topic for her. I realised I could not use exactly the same questions with English and Japanese teachers for cultural reasons. What I had to try to do was to ascertain how they understood craft education. So, I decided to re-design the schedule for Japanese schools and to explain the research briefly in an introduction so that teachers could understand better why it was important. I tried to formulate questions that stimulated their ideas and helped them to talk about them in their own way rather than asking them directory, which is not appropriate in Japan. For example,

> A finding from previous research in Japan and England was that the definition of craft is very confuse/unclear and is changing in both countries. It was difficult for me to define it for this research because in the specialist literature there are so many different definitions. So I would like to ask how you personally understand the term. What comes into your mind when you hear the words, *kosaku* and *kogei* (craft)?
>
> 以前の日本とイギリスでの調査で工芸という言葉の定義が混乱している、はっきりしない、また、変化してきているということが明らかになりました。私自身、この研究のためにそれらの言葉を定義づける難しさを感じました。そこで、先生ご自身がどのようにそれらの言葉をご理解されているかお話していただきたいと思います。工作・工芸という言葉を聞いてどの様なことが思い浮かびますか。

The teachers I interviewed in Japan were concerned whether their answers were right or wrong, so it was important for me to emphasise that I wanted to listen to their own opinions.

The interviews were recorded on tape. The length of time for completing the interviews depended on the interviewees' responses. Though I anticipated completing within approximately thirty minutes, this was not always the case. They were conducted after or during the observations, whenever teachers had time and wherever they felt comfortable.

I planned to conduct interviews with students after lessons in the schools I visited. However, it was impossible because there was not enough time. Therefore, I talked to some students informally during the lessons I observed. I had more time for this in Japan than England. I asked the question like, 'how did you get this idea? (looking at their work)' and 'do you think it is important to make things skilfully and beautifully?'

2. 5 Procedures for data analysis

I used the term 'interpretation' for the method of qualitative data analysis in this research because the focus is on analysing meanings of craft education in the two countries. There were three levels of data interpretation. The first level was 'description', that is a description of craft education in England and Japan. At the second level, 'comparison', I compared the key findings from the two countries. The third level was a 'theoretical interpretation'. This was the most important level, at which I analysed, investigated and reflected on the most significant findings and themes from the data in depth and considered them in relation to theories of craft and craft education in order to draw conclusions. I explain the process of interpretive data analysis as follows.

Table 2. 11: Levels of data interpretation

The 1st level	Description of craft education in England and Japan
The 2nd level	Comparison of craft education in England and Japan
The 3rd level	Theoretical interpretation

2. 5. 1 The first level of data interpretation: description

The descriptions of craft education were the first level of data interpretation in this research. The data I collected in note form during the document analysis, observations and interviews in England and Japan had to be summarised and studied in depth first before I could describe craft education in the two countries holistically. I will explain how I did this as follows.

2. 5. 1. 1 Policy documents

After completing the searches for source materials in each country, I had a collection of photocopied policy documents. First I read them very carefully to get a general sense of their content and reflected on it. I made a list of questions to help me detect and investigate the references to craft education and studied the texts in more depth so as to try and reduce the quantity of data, For example, I asked myself ‘How is the term ‘craft’ used in these documents?’ My questions were linked to the original research questions and informed by some of the theories I had identified when I conducted the literature review. With these questions in mind, I read the policy documents again very carefully and looked for answers to them. I marked sentences or words, which seemed helpful for answering them with coloured pens, made lists of the answers and grouped similar ones so as to reduce the numbers. The answers identified most frequently were considered more important than the others. For instance, in the English policy documents, I established that the term ‘making’ was frequently used for ‘craft’ and decided it was a substitute for craft.

2. 5. 1. 2 Observations

After each observation, I revisited the notes I had written down by hand in my notebooks and summarised them in a Word document in the form of a description. First, I read the

notes to get a general sense of the data I had collected and then I read them carefully one by one. I drew on my own background knowledge and experience of teaching and learning craft in schools to help me reduce the data from my notes. I marked sentences or words I thought were important while I was considering the research questions, ideas about teaching and learning craft in the literature and my own teaching knowledge and experience, with different coloured pens and made notes about my thoughts in the margins of the copies of the documents. For example, in the summary of my observations of one Design & Technology lesson in a Word file, I noted that 'the teacher showed how to bend a piece of metal to a group of students' and 'the teacher taught individually by showing how to do it with pink coloured pen' and put a comment 'different forms of demonstration' in the margins. Then, I grouped the sentences and words marked with coloured pens and gave them headings in my summary in my notebook. For example, I grouped the data about teaching and learning activities for developing skilled knowledge in England under the following headings: (i) 'demonstration and observation'; (ii) 'peer teaching'; (iii) 'showing exemplary work'; (iv) 'researching techniques'; (v) 'technical instructions' and (vi) 'practising skills'.

2. 5. 1. 3 Interviews

Firstly, I transcribed the data from the interviews one by one in each language. I read the transcriptions carefully to get a general sense of what the teacher concerned had told me and then listed all the answers to each question one by one using the Word programme on my computer. For example, I listed all the teachers' answers to the question about concepts of craft together. Then, I printed them out and marked recurring/ similar answers with coloured pens, grouped the answers and named them using subheadings. For example, for the question about craft concepts, references teachers made to; **'**making something', 'hand-made' and 'tactile things' were placed in the same group.

After I had analysed each set of data from the document analysis, observations and interviews separately, I tried to describe the data from each country holistically. I put the data together and described it under the headings that had emerged during the preliminary analysis. The main headings in the chapter, which describes the research in England were: 'analysis of Art & Design and Design & Technology policy documents', 'fieldwork' and 'teachers' views of craft education'. Under these headings, I also created sub-headings that had emerged from the data. For example, under the heading 'fieldwork' in England, there were eight subheadings: (i) 'background to fieldwork'; (ii) 'examples of craft projects'; (iii) 'types of crafts'; (iv) 'displays'; (v) 'content activities and teaching and learning strategies for skilled knowledge'; (vi) 'content activities and teaching and learning strategies for design thinking'; (vii)'assessment methods' and (viii) 'resources'. The final descriptive interpretations of craft education in England and Japan are reported in Chapters 3 and 4, respectively.

2. 5. 2 The second level of data interpretation: comparison

At the second level of data interpretation, I compared craft education policy and practice in schools in England and Japan, so that I could determine the main similarities and differences. The comparison enabled me to consider strengths and weaknesses in craft education policy and practice in the two countries and determine what might and might not be successful in the future. I re-visited the descriptive reports in England and Japan again and then compared the data from the document analysis, observations and interviews (cross checked). To help me do this, I organised the data into six broad comparative themes. They were: (i) 'concepts of craft'; (ii) 'concepts of design thinking'; (iii) 'purposes of craft education in schools'; (iv) 'types of crafts', 'content, activities and teaching and learning strategies relevant to art education' and (v) 'assessment'. The process of comparison was facilitated by the use of tables, which listed similarities and

differences between policy and practice in the two countries. The comparisons in the tables were organised under three headings: ‘policy’, ‘practice’ and ‘teachers’ perceptions’ - with one exception the table for ‘assessment’. The tables and key findings about similarities and differences between craft education in the two countries are included in the first part of Chapter 5 (5. 2).

2. 5. 3 The third level of data interpretation: theoretical interpretation

The main aim of the final stage of data interpretation (theoretical interpretation) was to make meaning from the data. This was effected by reflecting on and questioning selected key findings from the comparison in the light of existing explanations and theories of craft and craft education and considering how my ideas had changed as a result of the research. I looked for explanations and solutions of issues and conflicts in ideas that arisen during the comparison and explored five ‘interpretive themes’ to help me come to conclusions about the research questions. Through investigating these interpretive themes that had arisen from the data together with existing theories of craft and craft education I hoped to be able to confirm, contribute to and/or extend existing theories of craft and craft education.

The five interpretive themes I formulated were unresolved issues, conflicting ideas or questions I felt I had to answer. I considered : (i) ‘the relative merits of traditional versus contemporary concepts of craft and craft education’; (ii) ‘possible justifications for craft education in the twenty-first century’; (iii) ‘what are the most successful strategies for teaching design thinking?’; (iv) ‘the benefits of the apprenticeship model of craft learning’ and (v) ‘ the role of aesthetic judgement in school based crafts’. Taking into account the research questions, I tried to link the interpretive themes to relevant discussions of them in literature about craft and craft education. Also, the thinking about

these themes at this point in the interpretation was linked to analysis of my personal experience. For example, when I investigated the interpretive theme of ‘apprenticeship’ and looked for answers to the question, ‘Is it really possible to apply the apprenticeship model of learning to craft education in schools?’, this was intended to help me answer the research question ‘Is a skill-based craft curriculum compatible with one that aims to develop individual ideas?’ Examining how the apprenticeship model of learning in craft was explained in the literature and why scholars think it is important helped me identify what aspects of it were being or were not being taught in schools and the effects on student learning. I researched the characteristics of the apprenticeship model of learning in society and the use of it in schools in literature from cognitive science, art and craft and education. When I learned and taught crafts in schools, the priority was always on acquiring specific craft skills through copying best practice as shown by a teacher, and developing original designs was neglected. Finally, integrating the results of investigation necessitated deep or creative thinking on my part so as to draw conclusions for each interpretative theme. Thinking about the themes in depth helped me to create meanings from the data and link them to existing theory. When I investigated the interpretive theme ‘the relative merits of traditional versus contemporary concepts of craft and craft education’ I researched recurring ideas about craft in the data together with ideas about : ‘creative and design thinking’, ‘functional objects’ and ‘skilled making’ in the literature in the history of art, craft and design education history to try to find explanations of issues. This helped me consider how to conceptualise craft in schools in England and Japan for myself. Taking into account the results of this investigation, I concluded that concepts of craft in schools were not the same as those in society that are not influenced by general educational aims and that the conflict between design thinking and skilled knowledge lies at the heart of craft education but it does not necessarily imply a choice between one or the other. The

results of this final level of interpretation are reported in the second part of Chapter 5 (5. 3). The investigations and conclusions for each interpretive theme helped me answer to the research questions in the final chapter.

2. 6 Validity and reliability

According to Silverman, 'validity is another word for truth' (2000; 175). Validity can be explained as the degree to which 'what is observed' is the same as 'what was purported to be observed' (Robson, 2003; 553). The strongest argument for qualitative study is that it incorporates a chain of evidence. Regarding the validity of this research, however, 'researcher bias' could potentially have been a problem. According to Robson, this always occurs in research involving people and 'the notion of researcher as instrument emphasises the potential for bias' (2003; 172). Ahern (1999) suggests using reflexivity to identify areas of potential researcher bias and to reduce this problem (in Robson, 2003). Reflexivity, which is 'the process of researcher reflection on their actions and value', and 'the effects they may have', is stressed in phenomenological approach to qualitative research (Robson, 2003; 551).

I addressed issues of researcher bias in the following ways. The various kinds of data were triangulated during analysis to enhance the rigour of the research (Anderson, 1990, Robson, 2003). I recognized that subjectivity was an issue. Therefore, I applied the concept of reflexivity to help me to identify areas of potential researcher bias (Robson, 2003). At this point in the research, I reflected on the fact that I had studied Japanese painting for six years in Japan and had a particular interest in traditional materials and techniques and East Asian art. Although I was not trained as a craftsperson, I probably favour technical aspects of crafts learning and traditional crafts rather than contemporary crafts or developing creative ideas. I had a long experience of attending lessons as a student, so this probably affected my perspective as an observer. I tried to

carry out on-going reflection on my own influence on the research questions, methods and processes of data collection, data analysis, and research reporting in the field notes (Appendix III).

Reliability refers to whether a tool or instrument produces consistent results. During this research I tried to reflect upon my actions and values and kept a research journal to help minimize threats to reliability. Qualitative researchers are expected to present the construction of the study including personal reflection processes, such as self-examining and self-questioning (Lincoln and Guba, 1990; 54). So I carried my notebooks everywhere and kept writing in them throughout the research. The process of this research including how I developed my ideas about this study was particularly important.

Reliability of data is a difficult issue in qualitative research because the researcher is part of the construction of the research itself. According to Robson (2003), well-organized qualitative research uses triangulation, which uses multiple data resources to increase the rigour of the research. Also, conclusions suggested by various data sources are stronger than those suggested by one alone. I tried to use data triangulation and a variety of data collection methods as a means of minimising bias (Robson, 2003). In this research, I attempted to use document analysis, non-participant observation and semi-structured interviews.

2. 7 Ethics

The research procedures followed the ethical guidelines of Roehampton University and the UK Data Protection Act 1998. In addition, the following specific issues related to this research were taken into consideration.

Written consent, using the Roehampton University research participant consent form was obtained from all participants. In England and Japan, I attempted also to obtain informed consent from the head teachers and art teachers/craftspeople (Appendices VIII, IX). However, the teachers got permissions from their head teacher. So I only obtained the informed consent from the teachers I interviewed (Appendix X). A particular concern was that students in schools might confuse the information I required with compulsory school work. In both countries, I asked the teachers to inform their students what I was going to do briefly in advance and I explain the research intentions, procedures, and expected benefits to them myself.

In the interviews with the teachers, I tried to avoid using leading questions and making assumptions. I tried to design questions and topics from the viewpoint of participants and make them interesting for them. I asked permission to audio record the interviews with the teachers before carrying them out and told them the recorder could be turned off whenever they wanted.

Consent to take photos was sought from participant art teachers and craftspeople and head teachers on behalf of students. This research investigated how teachers encourage learners to develop creative design ideas and craft skills; therefore, it did not use photography to document participants' faces only the learning environment, resources, materials, tools and equipment, their respective uses, student work and different phases of production. In addition, consent for presenting photos in the thesis, at art education conferences and journals was sought and agreement was the data would be used strictly for the purposes of this particular educational research.

Before I carried out the fieldwork, I explained to the teachers that the focus of this study was on understanding how teachers encourage students to develop design ideas and craft skills rather than making judgements about their own work.

All the collected data was dealt with confidentially. To ensure anonymity, in writing or in oral reports, code names have been used for all participant teachers, students and schools. Also, where participants used proper names, these were changed in this text. I offered interviewees the possibility to check summarized transcriptions of interviews so that they could change them or withdraw what they disagreed with. However, nobody asked me to give them the transcriptions.

CHAPTER 3
CRAFT EDUCATION IN ENGLISH SCHOOLS

3. 1 Introduction

This chapter reports the findings of document analysis of craft education policy in England and teaching craft in English schools. The first part of this chapter reports the findings from the analysis of policy documents. The second part describes the data gathered from fieldwork conducted in English schools between February and July 2006.

3. 2 Analysis of Art & Design and Design & Technology policy documents

3. 2. 1 Background to document analysis

This part of Chapter 3 describes and analyses the data gathered from the document analysis conducted in England. The main aim was to determine what theories if any, underpinned policy, and what kinds of curriculum contents and learning and teaching strategies it promoted. Also, I wanted to gain the general information about craft education in England and to examine how policy was implemented in English schools in practice and compare this with Japan. The documents analysed consisted of the National Curriculum, National Curriculum Schemes of Work, General Certificate of Secondary Education (GCSE) specifications and examination papers and inspection reports by the Office for Standards in Education, Children's Services and Skills (Ofsted). The reason they were chosen to help me understand craft education in English schools was that these were legal documents.

The National Curriculum for England and Wales is a statutory entitlement to learning for

all students up to the age of sixteen. The National Curriculum for every school subject consists of ‘a programme of study’ and ‘attainment targets’. According to this document (DfEE & QCA, 1999, 2004), the former specifies ‘what pupils should be taught’ and the latter ‘the expected standards of pupil performance’. At the time the research was carried out, the programme of study for Art & Design had two sections, ‘knowledge, skills and understanding’ and ‘breadth of study’. ‘Knowledge, skills and understanding’ was divided into four learning domains; 'investigating and making', 'exploring and developing ideas', 'evaluating and developing work' and 'knowledge and understanding'. ‘Knowledge, skills and understanding’ in the programme of study for Design & Technology referred to ‘developing, planning and communicating ideas’, ‘working with tools, equipment, materials and components to make quality products’, ‘evaluating processes and products’ and ‘knowledge and understanding of materials and components’. Because this way of specifying curriculum domains differed from Japan, I had difficulty understanding it.

The General Certificate of Secondary Education Examination (GCSE) is a national examination system that assesses pupil attainment at the end of compulsory secondary education. The GCSE is offered by awarding bodies, which are independent commercial enterprises but the content of examinations are set according to nationally agreed criteria by Qualifications and Curriculum Authority (QCA) (2006a,b). When I investigated craft education in England in 2006, there were three main authorised awarding bodies: ‘Assessment and Qualifications Alliance (AQA)’, ‘Edexcel’ and ‘Oxford Cambridge and RSA Examinations (OCR)’. All students at Key Stage 4 followed the

same National Curriculum programmes of study and the GCSE examinations were based on the National Curriculum. However, GCSE syllabuses for the boards differed slightly. GCSE is a two-year course. At the end of the two year GCSE course, candidates receive a grade for each subject. In most subjects, candidates are required to complete one or more coursework assignments. The grade is determined by their performance in both the final examination and the course work. An external exam is carried out towards the end of the course. As Japan does not have national exams for secondary education, again it was difficult for me to understand this system. I could not understand it simply by reading the policy documents but had to talk with school teachers and university lecturers about it.

I discovered that the Office for Standards in Education, Children's Services and Skills (Ofsted) inspects education and training for students of all ages. The Education and Inspections Act, which established Ofsted, specifically requires this organization to 'promote service improvement, ensure services focus on the interests of their users, see that services are efficient, effective and promote value for money' (http://www.ofsted.gov.uk/). It carries out inspections and regulatory visits and publishes findings. Although I investigated inspection reports of the schools I visited, the most recent reports did not refer to teaching and learning in Art & Design or Design & Technology.

The National Curriculum schemes of work I looked at gave schools, departments and teachers ideas about how the National Curriculum could be interpreted in the classroom but were non- statutory. Teachers are free to use as little or as much of them as they

find helpful, and adapt and promote ideas to meet their students and their schools' needs (DfEE & QCA, 1998, 2000a,b,c). The schemes of work included examples of teaching strategies based on policy and all the primary school teachers I observed in this research used them. I investigated these documents in order to examine teaching strategies suggested by the British government.

In the early stage of investigating documents, I realised that the terms 'craft', 'skilled knowledge' and 'design thinking' were not very evident. I developed a list of questions to help me investigate manifest and hidden inferences to craft in the texts. The list of questions included the following.

1. How is the term craft used in the documents?
2. How are skilled knowledge and design thinking described?
3. What kinds of aims are relevant to craft education?
4. What types of crafts are recommended as schools curriculum content?
5. Which teaching strategies are advocated to help students manipulate materials and tools and acquire specific craft techniques?
6. What resources are recommended for craft?
7. Which teaching strategies are recommended to help students generate and develop design ideas?
8. What resources are recommended for design?

The content of the following sections of this chapter are organised into five main sub-headings: (i) core concepts; (ii) types of crafts; (iii) content, activities and teaching and learning strategies; (iv) resources and (v) assessment methods.

3. 2. 2 References to craft, design thinking and skilled knowledge

3. 2. 2. 1 Craft

I read through the National Curriculum for England and Wales and GCSE specifications for the two subjects first to see whether the term, 'craft' actually appeared. In Art & Design, 'craft' was mentioned as one of several art areas but its meaning was not explained in this document. The term was not used at all in the Design & Technology documents. The GCSE Art & Design specifications stated that the generic terms 'art' and 'art and design' were intended to embrace art, craft, design and any other associated activities (QCA, 2006a).

Although the term 'craft' was hardly used, the term 'making' appeared frequently in the National Curriculum documents for both subjects. Craft does not mean simply 'making'. However, in the attainment targets, making was used for level one to five and included together with to 'realise their intention' from level six to eight (DfEE & QCA, 1999; 39, 40). This implied that making was equated with realising individual ideas.

Each scheme of work for Art & Design explained whether or not art, craft or design was included. This suggested a definition of craft was implicit throughout the policy documents. In the schemes of work, craft did not include drawing and painting but referred to working with textiles and clay. It was clear that even in the policy documents, there was confusion about the definition. I was surprised to find this lack of attention to craft since Japanese policy for Art clearly specified craft activities and distinguished them from art.

The National Curriculum for Design & Technology stated that students were expected to learn how to make quality products and systems. For example, ‘making quality products’ and ‘producing quality products’ appeared in the programmes of study for Key Stages 2 and 3, respectively (DfEE and QCA, 2004; 18, 20). The document stated that students should be taught ‘to make single products and products in quantity, using a range of techniques’ (DfEE and QCA, 2004; 20). Regarding the definition of craft used in this research, making quality products is important since it equates with making something skilfully and well. After reading the policy documents, I questioned if craft included mass production. This document mentioned ‘aesthetics, social and environmental issues, function and industrial practices’ as important values that might influence designing and making products (DfEE and QCA, 2004; 15). Because I knew aesthetics and function were important considerations in the Japanese National Curriculum, it appeared that the definition of craft in Design & Technology might be similar to the one in Japan. However, despite the fact that the subject title, Design & Technology was originally ‘craft, design and technology’, I learned that the term craft had completely disappeared from any policy documents for this subject.

3. 2. 2. 2 Design thinking

The National Curriculum for Art & Design used the term ‘design’ as a noun together with ‘art’ and ‘craft’ and as a verb together with make; for example, ‘design and make images and artefacts’ (DfEE and QCA, 1999; 18, 20). Design was identified, as a distinct activity separate from ‘making’ but the policy documents did not give me any insight into the meaning of the concept ‘design’.

However, I reasoned that in Art & Design, the curriculum domains: 'exploring and developing ideas' and 'evaluating and developing plans for independent work' might be relevant to the definition of 'design thinking' developed for this research, which refers to a way of creative thinking in which people generate and develop their own ideas for making. The review of literature had shown that 'exploring and developing' and 'evaluating' ideas was central to design thinking. In the schemes of work for Art & Design, there was a category called 'Design'. However, I found this referred to making products for industry rather than design thinking.

In the National Curriculum for Design & Technology, 'developing, planning and communicating ideas' and 'evaluating processes and products' were compatible with the concept of 'design thinking' as specified in this research because they mentioned the process of generating and developing ideas. The emphasis on developing and evaluating ideas was similar in both school subjects, but in Design & Technology, processes of design thinking were specified in more detail; for example, 'generate ideas for products after thinking about who will use them', 'develop ideas and explain them clearly', 'plan what they have to do' and 'communicate design ideas in different ways as these develop' (2004; 18).

3. 2. 2. 3 Skilled knowledge

I searched for evidence of the concept of 'skilled knowledge' in the National Curriculum documents for both subjects. This was even less clear.

The National Curriculum for Art & Design mentioned ‘skilled knowledge’ in the curriculum domain called ‘investigating and making art, craft and design’. It was stated that students were expected to gain the knowledge of how to manipulate materials. At Key Stage 3, finer making skills were expected than at Key Stage 2. Skilled knowledge was not advocated for its own sake but for realizing ideas. The National curriculum stated that students at Key Stage 3 should be taught about ‘the visual and tactile qualities of materials and processes’ and ‘how these can be manipulated and matched to ideas, purposes and audiences’ (QCA & DfEE, 1999; 20).

In the National Curriculum for Design & Technology, activities associated with ‘skilled knowledge’ were mentioned in the curriculum domain called ‘working with tools, equipment, materials and components to make quality products’ (QCA & DfEE, 2004). This document stated that students should be taught to make products by manipulating materials accurately and finishing them appropriately to accomplish functional results. This document referred to the use of new technologies such as CAD and CAM for consistency and accuracy in designing and making (QCA & DfEE, 2004). These are computer-based tools to assist the design process. It was clear that competence in manipulating the new technology was considered an important component of learning in this subject. At the beginning, I was surprised at this emphasis on new technologies but on reflection realised that it would be difficult for people to make products in industry today without using them.

3. 2. 3 Aims and objectives

To help me understand the aims for craft activities in schools, I investigated the National

Curriculum and GCSE specifications. I investigated general educational aims common to all school subjects and then the aims for Art & Design and Design & Technology because I though they might influence craft education in schools.

In all school subjects, there was a great deal of emphasis on developing students' creativity, thinking skills and literacy and numeracy and citizenship education (DfEE & QCA, 1999, 2004). Cultural policy referred to the need to understand diverse cultures. The stated educational aim was to prepare students for future employment; for example, to recognise the rage of possibilities for employment in the creative and cultural industries in Art & Design (QCA & DfEE,1999).

In the National Curriculum, I found that Art & Design mainly emphasised fostering creativity and imagination.

> Art and design stimulates creativity and imagination. It provides visual, tactile and sensory experiences and a unique way of understanding and responding to the world (QCA & DfEE, 1999; 14).

Also, it stated that cultural learning through Art & Design activities should occur and stressed learning about different cultures.

> They (students) explore ideas and meanings in the work of artists, craftspeople and designers. They learn about the diverse roles and functions of art, craft and design in contemporary life and in different times and cultures (QCA & DfEE, 1999; 14).

The programmes of study for all Key Stages stated that;

> Teaching should ensure that 'investigating and making' includes 'exploring and developing ideas' and 'evaluating and developing work'. 'Knowledge and understanding' should inform this process (QCA & DfEE, 1999; 14).

In all the GCSE specifications for Art & Design, creativity and practical skills were the

main concern (AQA, 2006a, Edexcel, 2003). According to the Qualifications and Curriculum Authority, all GCSE examinations must give students opportunities to develop; 'creative and imaginative powers, and the practical skills for communicating and expressing ideas, feelings and meanings' in art, craft and design (2006a; 1). It stated that students should have opportunities to develop 'investigative, analytical, experimental and interpretative capabilities, aesthetic understanding and critical skills…' (QCA, 2006a; 1). While these kinds of thinking skills were emphasised strongly, skilled knowledge was not specified, as was the case with the National Curriculum. It was not clear to me if 'practical knowledge' was the same as skilled knowledge. It also stated that students should develop knowledge and understanding of crafts in contemporary societies and in other times and cultures. Because teachers and exam boards were free to choose which cultures and times for their students, it may not be enough guidance.

According to the National Curriculum, Design & Technology aims to foster students who will be able to cope with changing technologies by thinking and solving problems creatively and autonomously.

> Design and technology prepares pupils to participate in tomorrow's rapidly changing technologies. They learn to think and intervene creatively to improve the quality of life (QCA & DfEE, 2004; 15).

This subject sets out to train students not only to become good users of products but also to be innovative employees for the future, particularly, in commercial enterprises and industry. It states that through learning design and technology, they will 'become discriminating and informed users of products, and become innovators' (QCA & DfEE, 2004; 15).

The programmes of study at all key stages required Design & Technology teachers to teach students how to develop ideas, plan, produce products and evaluate their own and each others work. On pages 20 and 22, it was stated that teachers should make sure that 'knowledge and understanding' are applied to 'developing ideas', 'planning', 'producing products' and 'evaluating' them (QCA & DfEE, 2004; 20 & 22).

According to QCA, GCSE courses should encourage students to demonstrate their design and technology capability in order to 'design and make quality products in quantity' (2006b; 10). As with the National Curriculum, a great deal of importance was attached to designing and making. For example, AQA stated that students should be encouraged to acquire knowledge, skills and understanding through;

- analysing and evaluating products and processes;
- engaging in strategies for developing ideas, planning and producing products;
- engaging in focused tasks to develop and demonstrate techniques (AQA, 2006b; 10).

The GCSE examinations for Design & Technology were revised in 2003. At this time, the aims were simplified to reflect the National Curriculum requirements better and included a new consideration of the influences of past and present design and technology on society. One aim was to;

> Consider how past and present design and technology, relevant to a designing and making context, affects society (AQA, 2006b; 10).

There was a strong emphasis on teaching design thinking in both school subjects. However, I gained the impression that Design & Technology included more skilled knowledge into its aims and objectives than Art & Design.

3. 2. 4 Types of crafts

The National Curriculum for Art & Design (1999) stated that students should have experience of various kinds of crafts from different times and places but it was unclear to me which ones. The GCSE specifications for Art & Design gave me a better idea about how craft disciplines were being taught in English schools. Two kinds of courses available were unendorsed and endorsed. The disciplines associated with the unendorsed Art & Design GCSE were various. For example, one of the exam boards, Edexcel stated that;

> painting, drawing, printmaking, sculpture, ceramic design, interior, product or environmental design, jewellery, constructed textiles, dyed textiles, printed textiles, woven textiles, knitted textiles, fashion, photography, film and video, advertising, illustration, packaging and typography (Edexcel, 2003; 10).

Endorsed Art & Design examination courses focused on one of these areas only that students were supposed to study in depth: Fine Art, Three Dimensional Design, Textiles, Photography and Graphic Design. Students had to work in depth a specific discipline. Appropriate techniques, materials and processes were also specified and explained in the GCSE syllabuses designed for Art & Design exam boards. The range of techniques, materials and processes suggested for students to study impressed me. It is not possible to learn photography, for example, in Japanese schools. However, whether they were available or not was up to individual schools.

In the National Curriculum for Design & Technology, I found that students were expected to make products for commerce and industry. It stated that students should;

> combine practical skills with an understanding of aesthetics, social and environmental issues, function and industrial practices. As they do so, they reflect on and evaluate present and past design and technology, its uses and

effects (QCA & DfEE, 2004).

The National Curriculum for Design & Technology (2004) required the use of a range of resistant and compliant materials. The exam board Edexcel offered five endorsed courses of study in this subject in the areas of resistant materials technology, textile technology, food technology, systems & control technology and graphic products (2002a,b,c,d). The exam board called AQA offered seven endorsed courses of study in the areas of electronic products, graphic products, product design, resistant materials technology, system and control technology, textiles technology and food technology (2006b,c,d,e,f,g). Students were expected to choose one of them. Also, they had to design and make functional products for the exams.

3. 2. 5 Content, activities and teaching and learning strategies

In order to identify teaching strategies for craft activities, I searched for references to contents, activities and general teaching strategies focusing on design thinking and skilled knowledge in the National Curriculum, GCSE specifications syllabuses and schemes of work. The National Curriculum for Art & Design emphasised the importance of students recording their research and analysing artefacts or products, observations of objects and discussing and critically questioning visual information as a means to generating and developing artistic ideas (DfEE and QCA, 1999). It suggested the use of sketchbooks as a way to organise and present information, research and idea plans in progress. Although the National Curriculum statutory orders required students to explore, manipulate and develop making techniques and processes, no particular teaching strategies for developing skilled knowledge were spelled out in this document.

The schemes of work for both school subjects provided schools and teachers with more detailed guidelines for developing ideas than skilled knowledge (QCA, 1998, 2000a,b,c). Lessons in the scheme of work for Art & Design at Key stages 2 and 3 were organised under themes, such as 'Objects and meanings' (Year 5, Unit 5A), 'Containers' (Year 5, Unit 5B), 'Talking textiles' (Year 5, Unit 5C), 'Life events' (Year 9, Unit 9A), 'Change your style' (Year 9, Unit 9B) and 'Personal places, public spaces' (Year 9, Unit 9C) (QCA, 2000a,b). Each unit was planned to take about ten or fifteen hours. The documents indicated what covered, if it covered 'art, design or craft', '2-D or 3-D work', 'individual work or collaborative work', art elements (e.g. line, tone, colour, pattern, texture) and art media (e.g. painting, collage, print making, digital media, sculpture or textiles) (QCA, 2000a,b).

The schemes of work for Art & Design implied students talked about the theme or respond to questions about it at the early stages of a project in order to generate ideas. Some questions were suggested in relation to artistic intention about materials, tools and processes used in artefacts or objects. In a unit for Years 5 and 6, called 'Talking textiles', it was suggested students 'discuss how stories have been represented in textiles, for example, discussing the Bayeux Tapestry and that teachers 'ask the children to describe the subject, content and features of work' (DfEE& QCA, 2000a, Unit 5C). It was also suggested that students collect information and do research and that teachers show them exemplary work by artists. The exemplary work and resources were not always precisely named. There was an emphasis on students recording their own activities and thoughts in sketchbooks. It was also recommended that teachers ask

students to talk about or refer to work by other people so as to inform their own; for instance, to compare and discuss artists' work. Visiting museums, galleries and other sites was recommended in the documents.

The schemes of work for Art & Design recommended that teachers ask their students to experiment with techniques, make small scale works, demonstrate how to make, to remind them of techniques they had learned before, and then combine them with new methods of making (QCA, 2000a,b). It stated that students should be able to investigate qualities of materials and processes and match them to the purpose. It recommended teaching basic techniques before students started making, for example, showing them how to make ceramic coils by rolling the clay into strips before making containers (Unit 5B, QCA, 2000a). Exploring materials and tools and inventing methods of working with them appeared to be the most important aspect of practical work and was emphasised the most.

For GCSE Art & Design examinations, the teachers gave students a theme or brief as a starting point or stimulus. The themes provided for one GCSE Art & Design Unendorsed - Controlled Test, by AQA in June 2006 were: Surfaces', 'The Bauhaus', 'Botanical Illustration', 'Ancient Egyptian Art', 'Movement', 'Colour' and 'Location'. In this examination, students were asked to choose one of these themes for their work and given some suggestions as to how to develop their ideas. An example for the theme 'Location' was;

> Look at the suggestions below based on the starting point Location. You may use one of these suggestions or you could develop your own interpretation.
>
> (a) You might study artists who have explored interiors or landscape and

produce your own work based on where you live, work or play.

(b) You could choose a suitable location and make an installation or produce a scale model.

(c) You could create a symbolic place based on your memories or imagination.

(AQA, 2006h; 3)

When I looked at the suggested teaching strategies, I gained the impression that the recommended teaching style was child-centred rather than teacher-centred. In my experience, this is not a typical teaching style in Japanese schools.

Specific stages in the design process were identified and described in the National Curriculum for Design & Technology. In Key Stages 2 and 3, these were: (i) generating and developing ideas; (ii) producing specifications; (iii) planning and (iv) evaluation. At Key Stage 3, teachers were expected to teach students how to use design briefs and identify and develop criteria for their own designs and evaluations. I discovered the instructions to Design & Technology teachers about how to develop students' design thinking were much more specific than the ones for Art & Design. For instance, the National Curriculum for Design & Technology stated that students should be taught to: 'identify relevant sources of information'; 'produce their own design'; 'develop criteria'; 'generate design proposals'; 'consider aesthetics and other issues' and 'suggest outline plans for designing and making' (DfEE & QCA, 2004; 20).

The schemes of work for Design & Technology included what were called 'focused projects'. A focus domain was stated for each unit. For example, at Key Stage 2, these were 'structures' or 'controls' (electrics and mechanisms). At Key Stage 3, each unit

was related to a specific kind of resistant or non-resistant material such as ‘understanding materials in textiles’ (2000c, Unit 7 aii).

All the units of work at Key Stage 2 for Design & Technology specified ‘investigation, disassembly and evaluative activities (ideas)’, ‘focused practical tasks’, and ‘design and make assignment’ (QCA, 1998). The first two tasks were preparation activities for making. All the units of work at Key Stage 3 were divided into; (i) ‘design and make assignment’, (ii) ‘product evaluation’ and (iii) ‘focused practical tasks’ (QCA, 2000c). Focused practical tasks were set within a specific project during which students were expected to learn specific skills in the process of designing and making.

In the schemes of work for Design & Technology, one theme was stated for each unit at Key Stage 2. Examples were ‘musical instruments’ (unit 5A) and ‘shelters’ (unit 6A) (QCA, 1998). At Key Stage 3, an example of a ‘design and making assignment’ was included and was rather like the ‘design briefs’ I saw being used in the schools I visited later on. For example, in Unit 08 eiii, called Producing batches, (focus: textiles), the theme was juggling balls and designing and making assignments was,

> Design and make a juggling kit for a celebration, consisting of a themed bag/container and matching juggling shapes. All the juggling shapes should be identical, so you will need to consider production aids to help you batch-produce identical shapes. (Unit 08eiii: Producing batches Focus: textiles) (QCA & DfEE, 2000c).

I did not find detailed requirements like this in the Art & Design schemes of work.

In the schemes of work for Design & Technology, strategies for developing and generating the students own ideas were included in the introductions to the units. They included investigating a collection of examples, discussion by students, and researching ideas from books, CDs, and the Internet. Teachers were advised to ask questions related to the task they give their students to help them focus. For example, in Unit 09biii, 'Designing for markets' (Focus: textiles) (Year 9), students were required to identify social needs and roles of products given a design brief and to conduct product evaluations in relation to the manufacturing industry (QCA, 2000c). Nine kinds of possible product evaluation sessions were suggested. For example, it was recommended they were 'to formulate criteria and use them to comment critically on the product's impact on the society', 'explore users' values, how the product is designed, material and tools used for the product, the quality of the product, manufacturing products and the manufacturing industry in a local area in the past and present' and 'to visit a local manufacturing company'. Teachers were advised to discuss whether they preferred hand-made or high-volume items with students. This document also suggested that students learned how to use ICT to support research and design in Unit 07c (QCA, 2000c).

Regarding further design activities, the schemes of work at Key Stage 2 for Design & Technology (QCA, 1998) advised teachers to explain tasks clearly, allow time for students to consider ideas, present them in a way that others understand, make lists of materials and other resources, propose a planned sequence of work, evaluate work and suggest future improvements. The emphasis was on students planning their work

before they started making products. In Unit 6B, called Slippers (Year 6), teachers were expected to explain to students they wanted them to design and make a pair of slippers but ask them to draw a design specifications first, sketch or model ideas, draw the chosen ideas, write step by step plans or draw a flow chart to demonstrate a work process and to evaluate the slippers against the design specifications before they made them and at the end (QCA, 1998). Teachers were expected to check if their students' final ideas were realistic before they began to make them. To help students develop design ideas they made prototypes, models or mock-ups, which they evaluated and modified before starting to make a final product.

In the schemes of work (QCA, 1998, 2000c), teaching strategies for developing making skills were described in detail in a section called 'focused practical tasks' for both Key Stages. In these tasks, teachers asked students to investigate materials and techniques, showed exemplary work to them and demonstrated how to make. In Unit 6B, teachers were required to demonstrate how to stitch right sides together (QCA, 1998). In addition, they were always expected to emphasise that products need to have 'a good quality finish'. In the Unit 08aii, called 'Exploring materials' (Focus: resistant materials) (Year 8), teachers were expected to demonstrate a range of finishing techniques to students, including the self-finishing techniques of casting polyester resin, enamelling, dip coating, painting and polishing and to discuss why these were appropriate to an end use (QCA, 2000c).

3. 2. 6 Resources

The schemes of work and the National Curriculum for Art & Design stated that

museums and galleries were possible resources for student work. Additionally, the National Curriculum emphasised the importance of learning about the roles of artists and purposes of art in society. I thought the schemes of work would be helpful for teachers in terms of planning lessons, especially for those working in primary schools. However, there were not many guidelines about how to use materials and tools.

The use of ICT was recommended in the National Curriculum for Design & Technology to help students gather information, explore, develop and communicate ideas and make products accurately. For example, it was stated that students should learn to make a single product and products in quantity, using a range of techniques, including Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) so as to ensure consistency and accuracy (DfEE & QCA, 2004). The National Curriculum for Design & Technology stated that 'investigating products and finding out about the work of professional designers and manufacturing industry' would increase students' understanding of designing and making (DfEE & QCA, 2004; 20). There was no mention of museums or galleries.

3. 2. 7 Assessment

The attainment targets I studied included in the National Curricula for those two subjects set out the knowledge, skills and understanding students of different abilities and maturities were expected to have gained by the end of each Key Stage (DfEE & QCA, 1999, 2004). Level descriptions were specified to help teachers make judgements about their students' performance at the end of Key Stages 1, 2 and 3. At Key Stage 4, national qualifications were the main way of assessing achievement of student learning.

All the descriptions ranged from levels one to eight and exceptional performance was specified. I had never seen standardized levels of attainments specified this way in Japan.

In the attainment targets in the National Curriculum for Art & Design, ‘researching’ and ‘self-evaluation’ seemed to be the most important capacities students were expected to develop. For example, these documents stated that students at Level 3 are expected to be able to ‘explore ideas and collect visual and other information for their work’ (DfEE & QCA, 1999; 39). Students at level 6 were expected to be able to ‘explore ideas and assess visual and other information…’ and to ‘use this information to develop their ideas, taking account of purpose and audience’ (DfEE & QCA, 1999; 40). At all levels, students were expected to be able to evaluate their own and others work and to develop their work using insight from others. For instance, students at level 3 should be able to ‘comment on similarities and differences between their own and each others' work, and adapt and improve their own’ (DfEE & QCA, 1999; 39). This document stated that students at all levels were expected to learn about materials and processes to realise ideas. Students at lower levels were expected to be able to understand and use materials and processes and the ones at higher levels were expected to manipulate them to realise their own ideas. It stated that students at level three should be able to,

> investigate visual and tactile qualities in materials and processes, communicate their ideas and meanings, and design and make images and artefacts for different purposes (DfEE & QCA, 1999; 39).

The assessment schemes for the Art & Design examinations had two components; one was called ‘internal assessment’ (AQA, 2006a; 2) or ‘coursework’ (Edexcel, 2003; 3).

The other was called ‘terminal examination’ (AQA, 2006a; 2) or ‘externally set assignment’ (Edexcel, 2003; 3). There were two, three or four possible units of coursework for each exam that included preparatory work in sketchbooks, logs or journals leading to final pieces. Assessment objectives for all the exams were set by QCA and were applied to students’ coursework over a two year period as a whole. The terminal examination was a controlled test, in which students were required to produce an art and design work in response to one given stimulus or brief intended as a starting point in a chosen area such as fine art or textiles. The starting points were set by the exam boards and a preparatory period of four weeks was allowed followed by ten hours of supervised time for completing the piece. Student coursework was internally assessed by teachers and moderated by the exam board. According to an art teacher I spoke to in one secondary school, coursework was assessed first in school (23/05/06), then, some sample works were taken to a local centre school chosen by the exam board where the students’ grades were compared and discussed by teachers and moderators from the exam board and changed, if necessary. Student work in the terminal examination was sent to each exam board and assessed by the examination board externally and nationally.

All the GCSE unendorsed and endorsed courses in Art & Design used the same set of assessment objectives even though the latter required students to work within a specific area like photography or textiles. There were four assessment objectives. They did not specify clearly how skilled knowledge should be assessed even though one main aim of this exam was to develop students’ practical and creative thinking skills. On the other

hand, all the assessment objectives included the phrases like students should be able to demonstrate their ability to ‘record observations, experiences and ideas…’ in relation to intentions, ‘analyse and evaluate images, objects and artefacts…’, ‘develop and explore ideas…’ and ‘present a personal response…’(QCA, 2006a, 2). However, I did not find any separate objective for assessing skilled knowledge. Skilled knowledge was assessed in two assessment objectives, ‘analyse and evaluate images, objects and artefacts… refining work as it progresses’ and ‘present a personal response, realising intentions’ (QCA, 2006a, 2). Whereas it was clearly considered a necessary competence for developing creative thinking, I found the lack of any clear statements about assessing skilled knowledge and suggested this was neglected in Art and Design.

The attainment targets specified in the National Curriculum for Design & Technology emphasised students collect and use information to meet a specific purpose and social need as a mean of generating and developing ideas (DfEE & QCA , 2004). For example, it was stated that students at level 2 should be able to ‘generate ideas and plan … based on their experience of working with materials and components’ (DfEE & QCA, 2004; 45). Also, students at level 6 should be able to ‘use a range of sources of information’ and demonstrate ‘they understand the form and function of familiar products’ (DfEE & QCA, 2004; 46). The attainment targets included references to the capacity of planning. For example, it was stated that students at level 6 should be able to ‘produce plans that outline alternative methods of progressing…’ (DfEE & QCA, 2004; 46). I did not find this in the Art & Design documents. In addition, students at all levels were expected to be able to evaluate both a product and process. It was stated

that students at level 3 should be able to ‘identify where evaluation of the design and make process and their products has led to improvements’ (DfEE & QCA, 2004; 45). I had never taught students ‘self-evaluation’ in Art lessons in Japan.

Students at all levels in Design & technology were also expected to know how to work with materials and tools. Students at level three should be able to ‘use tools and equipment with some accuracy...’ and at level six should be able to ‘work with a range of tools, materials, equipment, components and processes…’ showing their understanding of materials (DfEE & QCA, 2004; 45, 46). In contrast to Art & Design, there was more emphasis on working with materials and tools in this subject and this was more like what I was used to in Japan.

The assessment scheme for the national examinations in Design & Technology had two components and two ‘tiers’ of assessment; Foundation and Higher. This was different from Art & Design. All the GCSE syllabuses I studied stated that one component called the ‘internal assessment’ (AQA, 2006b,c,d,e,f,g; 3) or ‘coursework project’ (Edexcel, 2002a,b,c,d; 1) was supposed to address all the assessment objectives in an integrated way. The evidence for a project having been completed was a product, a concise design folder and/or appropriate ICT evidence. Projects were internally assessed by teachers and then externally moderated by members of the exam board. According to QCA (2006b), the weighting allocated to internal assessment must be at least forty percent and not exceed sixty percent in any scheme of assessment. The exam board called Edexcel stated that coursework project should not exceed forty hours and constituted sixty percent of a student’s total marks. There was another component called the

‘terminal examination’ (AQA, 2006 b,c,d,e,f,g; 3, Edexcel, 2002a,b,c,d; 1), in which students were required to answer questions in a chosen area under test conditions. The exam boards produced a ‘preparation sheet’ for the written exam at the beginning of March in Year 11 (AQA, 2006 b,c,d,e,f,g; 3,). All the questions were compulsory and students were given two hours to answer them in the formal test. This constituted forty percent of their final mark. According to QCA (2006b), schemes of assessment had to include a terminal examination with a minimum weighting of forty percent and a maximum weighting of sixty percent. The Edexcel terminal examination weight was forty percent (Edexcel, 2002a,b,c,d).

The assessment objectives for GCSE Design & Technology afforded design and making equal importance. There were three general objectives (QCA, 2006b). Two of them referred to design, ‘designing and making’ and ‘evaluation’. There were two objectives related to skilled knowledge, ‘materials and components’ and ‘designing and making’. Specific skills were required and each endorsed exam listed related objectives in detail under the general objectives. I concluded that the assessment objectives for Design & Technology in general were more specific than Art & Design and found more evidence of attention to making.

3. 3 Fieldwork

3. 3. 1 Background to fieldwork

This part of the chapter describes the craft education practice I saw in Art & Design and Design & Technology lessons in schools. I visited three primary schools and five lower secondary schools for one day each (Appendix XI). I also visited art shows in the secondary schools. The following description of what I found is based on data gathered

from my observations of craft activities, interviews with ten individual teachers and analysis of school documents. The main aim of this fieldwork was to understand craft education in English schools in order to be able to compare it with policy. The categories I use to describe the data are: craft projects, types of craft, teaching strategies, design thinking, assessment methods and teaching styles, resources and teachers' views about craft education. The category 'resources' includes 'accommodation and facilities', 'materials, tools and equipment', 'different types of teaching resources', 'artists in residence' and 'museum and gallery visits'.

3. 3. 2 Examples of craft projects

This section describes some examples of craft projects in English schools, so as to give the reader a general idea about what is involved. In the primary and secondary schools, an hour per week each was allocated for Art & Design and Design & Technology. However, in the primary schools, it was organized in blocks at certain periods of the year. In the secondary schools, it was taught on a regular basis every week. I could not find in the policy documents how much time schools are required to teach these subjects for, unlike in Japan. In primary school E2, around six projects were timetabled per year in Years 5 and 6. In the secondary schools I visited, pupils completed around two to four projects per year in Art and Design. For example, in secondary school E7, two projects in Year 9 and three projects in Year 11 were timetabled in Art & Design. In secondary school E6, two projects were timetabled in Design & Technology in Year 7.

3. 3. 2. 1 Craft projects in Art & Design

In secondary school E4, I observed an Art & Design project for Year 7. The participants

included the art teacher (EI) and twenty-one female students. The project I observed was about making sculpture, and the theme was ‘natural form’. I only observed one lesson (14/03/06). Students were expected to develop ideas for designing a sculpture based on this theme, and then make it. It was scheduled for approximately ten to twelve hours over a period of about twelve weeks. At the beginning of the lesson, the teacher checked students’ designs and progress, as individually recorded in their sketchbooks. She advised them if their designs would or would not work. For example, some students designed shapes to make out of clay that were too complex, so they were asked to re-design them. I saw some observational drawings of vegetables or flowers in sketchbooks used to develop ideas. The students worked by themselves because they had already started making their objects and were familiar with some techniques. However, some of them did not know how to make a pinch pot. The teacher demonstrated how to do this to them individually. When I asked the teacher about the students’ previous experience with using clay, she asked students if they had learned about ceramics or clay crafts at primary school. Out of twenty-one, only six students had this experience. This surprised both of us because we thought clay was a very popular material in primary schools. I did not think they made the objects skilfully. However, the students were very positive about their work and seemed to enjoy making them. I witnessed students helping each other. The teacher informed me that she would fire their sculptures using an electric kiln at the school. At the end of the lesson, she gave the students homework and asked them to make six rubbings of natural forms.

Another Art & Design project I observed was a craft based curriculum development

project run by '*Making It Work',* which took place at primary school E1. The participants were three classroom teachers (EA, EB, EC), an artist and twenty-seven boys and girls in Year 5. The project was about making a wooden jigsaw and had the theme 'High Street'. Students were expected to design and make a jigsaw which showed 'past, present and future Slough High Street'. I only observed one lesson, in which they were drawing their designs on wood (08/02/06). I was interested in this project because *Making It Work* has previously emphasised the importance of artists/ craftsmen working in schools to encourage young children to engage with craft materials and tools. The director of *Making It Work* informed me that at the beginning of this project, students visited Slough High Street with the artist and teachers. This was to take photographs and make drawings in order to develop ideas for their work. The artist showed them a mosaic she had made and exhibited in a public space. I could see evidence that this influenced the students' work. There were pictures of the street borrowed from a local museum in an art room. During the lesson, the artist said 'if their thinking was not deep enough, their drawings wouldn't be good'. In the lesson, a group activity was the main teaching and learning strategy. The artist and teachers formed groups and discussed the work with the students and gave suggestions. The artist suggested that one group investigate further using ideas from the Internet. As the project was focused on making skills, I expected to see more actual teaching of skills but I only observed the artist showing students how to use paint brushes. She mainly talked to students and the teachers just drew pictures with them. The artist not only had designing and making skills, but she also had good teaching skills. The students seemed to enjoy the session and liked the lesson very much. Some of them told me this was the best one they had

had at the school.

3. 3. 2. 2 Craft projects in Design & Technology

I observed a project in Design & Technology for Year 9 at secondary school E6. The participants included the teacher (ES) and twenty-four female students (18/05/06). The project I observed focused on a resistant material (metal) and students had to design and make a photo frame for a museum over the period of six weeks. I only observed it for one half hour session so I asked the teacher to explain the whole project. She told me that it featured making a photo frame out of a piece of metal and was inspired by the Spanish architect, Antonio Gaudi's work. I was surprised that she taught 'making a metal picture frame' as jewellery making, because I had understood jewellery as being what people wear for decoration. I saw the following design brief she gave to the students.

> Your brief is to design and make a one – off picture frame for the V&A museum in the style of Gaudi. You are then to produce a batch production jewellery range out of copper and enamel in the same theme. You as a designer must be innovative, original and be able to work in a team. You have six week.

In the lesson I observed, some students had already finished making the frame and were writing evaluations of their work. Many students were decorating their frames by shaping them with hammers. Several students asked her how to bend the metal to shape it. Then the teacher gathered the students around one desk and demonstrated the technique of bending metal. Many students were working with hammers and filing machines, so I could not hear what the teacher and students said very well. During the lesson, the teacher gave a short lecture about different kinds of metal and asked students to carry out further research for group homework. I saw evidence that students

had learned about the design process in their presentation sheets (Figure 3. 1). They had to: (i) follow a design brief; (ii) show evidence of research; (iii) produce specifications; (iv) generate ideas by brainstorming; (v) make a product and (vi) evaluate their work. The teacher informed me that students were expected to give a presentation about their work at the end of this project.

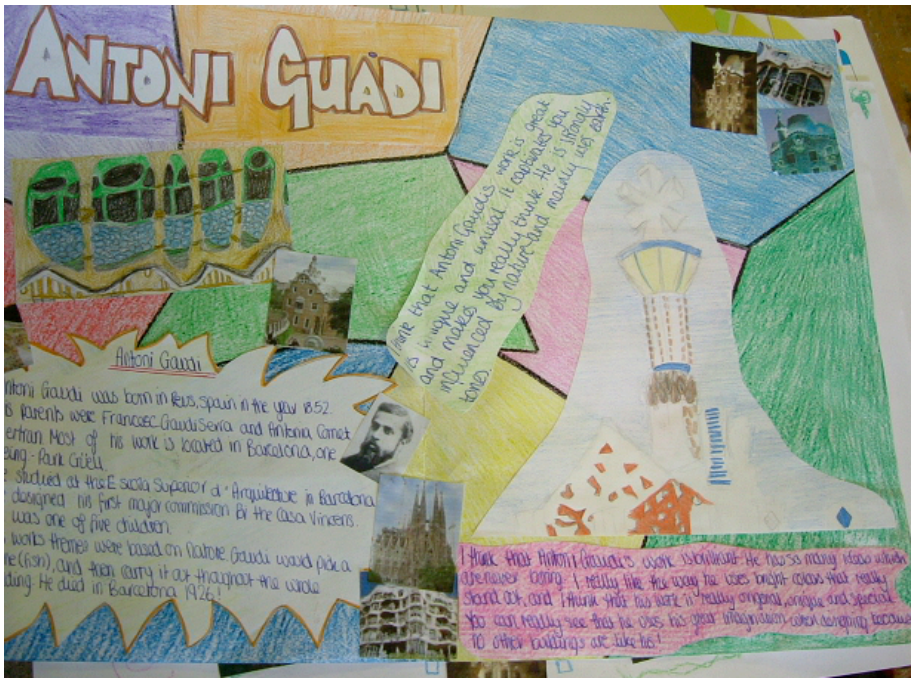


Figure 3. 1 Student presentation sheet

I observed a project in Design & Technology for Year 5 at primary school E2. The participants included the teacher (EE) and sixteen male students (14/05/06). The lesson I observed was about designing and making a pop-up card and was planed to last six weeks. She told me that she had used a teachers' guide produced by the Nuffield Trust to plan this scheme of work. Unlike the secondary schools I did not see any design brief. The teacher showed students examples of picture books using pop-up techniques, including 'The Snowman' which was originally created by Raymond Briggs in 1978**.** Her students made design plans and learnt some techniques before they started making their own cards. In the lesson I observed, the teacher taught techniques to students on

an individual basis and I witnessed some students teaching each other paper - making techniques.

3. 3. 3 Types of crafts

The main types of craft secondary school Art & Design teachers had taught or were teaching were: textile crafts (felt making, sewing, embroidery, weaving, appliqué and dying), paper crafts (papier-mâché, card making and print making) and clay crafts (tile making and mosaic). The materials used were mainly clay, textiles, paper and others (e.g. willow, wire) (Figure 3. 2). The students mainly learned about techniques for working with clay (slabbing and coiling), textiles (embroidery stitches such as running, back, cross and blanket chain stitch, beadwork, hand sewing and tie-dyeing) and paper (papier-mâché and pop-up card techniques).

The main types of craft secondary school Design & Technology teachers had taught or were teaching were: textile (dress making), wood (furniture making) and metal crafts (jewellery making) (Figures 3. 3 and 3. 4). The techniques they had taught and were teaching were for working with textiles, metals, wood and others (paper and plastic). When the teachers talked about the different kinds of craft activities they gave to students, they categorised them according to the policy documents and used terms such as ‘resistant materials’ or ‘textiles’. The work using textiles in Design & Technology was produced with clients and customers in mind whereas this was not the case in Art & Design.

Textiles was a common material in both school subjects. Observing textile projects was

interesting for me because I had never seen them in any art lessons in Japan. The teachers of both subjects told me they taught specific techniques for each project and gave students less freedom of choice at Key Stage 3 than Key Stage 4. Students at Key Stage 4 chose materials and methods by themselves in the national examinations.

Figure 3. 2 Textile craft (embroidery and dye)

Figure 3. 3 Dress for a play (GCSE)

Figure 3. 4 Chair (GCSE)

3. 3. 4 School displays

Displays of student's work gave me some idea about what kinds of craft are taught in English schools. Overall, I saw a lot of exemplary work by students displayed at both secondary and primary schools. The displays gave the schools a friendly atmosphere. In both the primary and secondary schools I visited, student crafts were displayed in visitor and student entrances, halls, and corridors. At secondary school E4, I saw student textiles and ceramics in the art department corridor, including embroidered bags and ceramic objects (14/03/06). At secondary school E7, I saw ceramic flowerpots made by students (09/05/06). At secondary school E6, I saw mirrors made in Design & Technology lessons displayed outside the assembly hall and in corridors (14/06/06). Some GCSE course work by students that had received high marks was displayed in the school entrance and reception area together with pages from sketchbooks showing the design process. In the primary schools I visited, a lot of student work was displayed all over the buildings and even in the play areas outside. At primary school E2, tiles made by Year 4 students were displayed on an outside wall (17/05/06). According to the teacher (ED) at this school, a craftsperson (a tile maker) had collaborated with students and teachers in the tile project. Colour prints (rubber) and collage work by Years 4, 5, and 6 students were displayed outside the dining room.

I also saw some craft objects in the specialist classrooms in the schools. For example, in the art rooms at secondary school E4, I saw many examples of student work in textiles such as bags, hats, dresses and tie-dye cloth displayed in a room mainly used

for this purpose (14/03/06). There were busts, torsos and small objects in a ceramic and sculpture room in this school, but no functional objects. I saw on-going student work in the art rooms at secondary school E7 (05/07/06). Students had been asked to do observational drawings of a neighbour's house for a 'birdhouse project' and then use them to design birdhouses out of card. Also, students had looked at masks from the film 'Lord of the Rings' before making 'Grotesque masks' (Figure 3. 4). This was interesting for me because I had not seen teaching referring to films or contemporary art as a stimulus for craft projects very much in Japan. There were a few craft objects in the primary schools. Primary school E2 had one art room that displayed many student paintings and prints (17/05/06). This room was used for Design & Technology lessons and contained paper craft objects and moving wooden toys made by students from commercial kits displayed in a glass case.

The work I saw in school reflected the descriptions in the policy documents. In secondary schools the work was more varied and I noticed more contemporary work in English schools than I was used to in Japan.

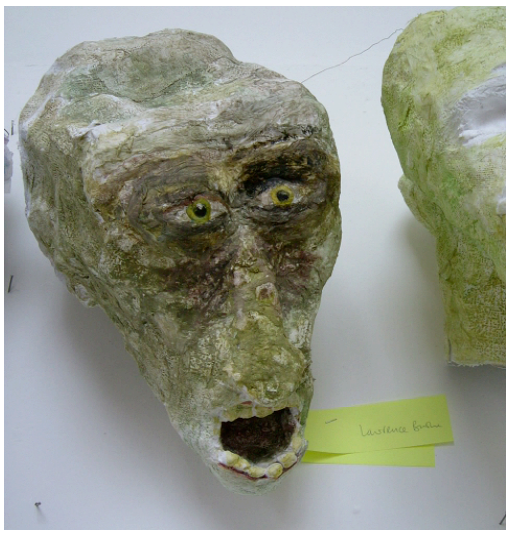


Figure 3. 5 Mask

3. 3. 5 Content, activities and teaching and learning strategies for developing skilled knowledge

The teaching and learning strategies for skilled knowledge I saw being employed in classrooms included demonstrations and observations, peer teaching, practicing techniques, researching techniques, showing exemplary work and giving out instructional posters.

3. 3. 5. 1 Demonstration and observation

The teachers used demonstration as a method of teaching skills in making in both school subjects. I saw a great deal of one to one demonstration, which surprised me because it is time consuming. The teacher (EH) in secondary school E4 demonstrated how to do running and star stitching in front of all the students in a textile project in Art & Design (14/03/06). She did this using a small piece of cloth, a needle and blue thread using the same tool and materials she gave to the students. Because I was too far away to see the demonstration and she did not explain it in words, I could not follow what she was teaching. After the demonstration, a few students practised the stitchies next to the teacher and others started to make their own work without practising. After they had tried them out for a while, many students asked the teacher to explain the techniques individually. The teacher told me her students could not absorb information about how to make different kinds of stitches all at once so she had to introduce a few each week. Although I was concerned about this unsystematic way of teaching techniques, the students kept on working. In my experience, this was very different from the way Japanese students behave because they are always concerned about doing things well

and not making mistakes. At secondary school E6, I witnessed the teacher (ET) giving a lot of individual demonstrations to students in a Year 10 textile lesson in Design & Technology (18/05/06), in which students had to make a summer dress. She sat at her desk while the students queued up to see her. She answered each one's questions and then showed them what to do. She told me that she liked to respond individually to their needs. Each student was creating her own design so the technical skills they required differed. However, there were twenty-five students in the lesson, which made it difficult to teach this way. At primary school E2, when the teacher (EE) taught one student a technique in a Design & Technology lesson, the others studied the results carefully (24/05/06). In addition, I observed this happening in the other primary and secondary schools.

3. 3. 5. 2 Peer teaching

I witnessed students asking each other questions about making processes. At secondary school E4, I saw Year 7 students making ceramic sculptures inspired by natural forms in an Art & Design lesson (14/03/06). One girl had difficulty making pineapple leaves out of clay, so her friend helped her. They seemed to enjoy working together. At primary school E2, I observed an Art & Design lesson in Year 5 in which students made fishes out of paper whilst helping each other (17/05/06). Although I thought the techniques used in this project were rather simple, the students found them difficult. Some of them did not put enough glue on the paper and others put too much. I showed them how to make shapes with smooth surfaces. One boy panicked and was about to give up because he had not finished making his shape in spite of working hard.

However, a few able students finished quickly and helped friends who were struggling.

3. 3. 5. 3 Exemplary work

In the primary and secondary schools, examples of finished work by students and artists were shown during Art & Design and Design & Technology lessons. For example, at E4 secondary school, exemplary pieces of embroidery and appliqué (felt bags with embroidery and felt), ceramics objects and terracotta masks made by older students were displayed in school corridors and art rooms (14/03/06). The teacher (EG) informed me the same projects took place every year so students often got ideas from the displays. Some teachers told me that they showed Key Stage 3 students' GCSE exemplary work to facilitate understanding. I also witnessed Key Stage 3 students planning to take GCSE Art & Design courses attending the GCSE art show at these schools. At primary school E2, the teacher (ED) showed examples of student work before the students made fishes out of paper (24/05/06). At secondary level, students were expected to research techniques used by artists by themselves. For example, at secondary school E7, the teacher (EU) told me that she showed an exhibition catalogue of work by Japanese textile artists to students and asked them to research their techniques (05/07/06). I frequently found evidence of this kind of research in the students' sketchbooks when I looked through them.

3. 3. 5. 4 Researching techniques

In both the school subjects at secondary school level, students were expected to research making techniques and processes alone and present evidence of conducting practical experiments in their sketchbooks in writing and visually. This was the most

popular method of learning techniques I experienced in the schools. At secondary school E4, the teacher (EG) told me that art lessons always started with her checking student sketchbooks (14/03/06). In one case, they had researched different kinds of stitches using the Internet. They drew and wrote about how to make these stitches and what they looked like using coloured pens or pencils. Their sketchbooks included not only drawings but also actual examples of stitches on small pieces of cloth. I witnessed students using the sketchbooks to check how to do stitches during the lesson. Similarly, at secondary school E6, I looked at a student sketchbook for GCSE textiles in Design & Technology, which had been awarded a grade A (18/05/06). Two pages were set aside for 'fabric research', one on decoration and another on materials. The student had been asked to research the most suitable fabric for a summer dress. She had experimented with different methods of surface decoration including tie dye, fabric pen, block print and batik and analysed and evaluated their suitability for her dress. I observed research involving exploration and analysis of techniques in GCSE recorded in sketchbooks in both subjects at all the secondary schools. There was a lot of emphasis on students investigating ideas, techniques and materials at secondary level. However, I did not see any student doing research of this kind in the primary schools.

3. 3. 5. 5 Technical instructions

The use of instruction posters with information about techniques was commonplace in both school subjects. At secondary school E4, some posters with embroidery techniques made by the teacher were placed on top of work desks during lessons (14/03/06). At primary school E2, where I observed Year 5 students making 'pop up

work cards' (24/05/06), the teacher (EE) placed fifteen posters about techniques used to make pop up cards published by the Nuffield Foundation, a UK charitable trust, on the floor. They included different card techniques from complex to simple. I did not see students using the posters or handouts during the lessons in the schools I visited, which surprised me.

3. 3. 5. 6 Practising skills

At E4 secondary school E4, I witnessed students practising embroidery techniques both during lessons and at home (14/03/09). They were asked to practise at least three stitches for homework. As mentioned previously, most students did not practise techniques very much in lessons. This was the only time I saw techniques actually being practised in a lesson.

3. 3. 5. 7 Teachers' views

A recurring answer to my question about effective ways of developing skilled knowledge was demonstration and practising techniques.

Demonstration and practicing techniques

Several teachers of both subjects told me that the best way of teaching was through demonstration.

> We demonstrate and show how to do it and show the end products (EK).
>
> To get outside people to demonstrate actual craft work... (EG).
>
> We do demonstrations. But we have to demonstrate how to make more than once. We have to do a whole class demonstration and then go around some of the tables to weak students... (ER).

Two teachers emphasised a combination of demonstration and practicing techniques (EO, EE).

> To demonstrate and get into exploring …there is no other way of doing it. Craft activities enable you to experiment and try things out (EO).

> You can demonstrate. But actually until they do it by themselves they don't realise … you can't just demonstrate it. They have to experience it. They have to practise skills (EE).

However, two teachers mentioned it was time consuming (EG, ER).

> This (demonstration) is an excellent way to learn how to make. But you have to be careful because it's a bit time consuming (EG).

Teaching skilled knowledge in the curriculum

Two Art & Design and Design & Technology teachers stressed that acquiring skilled knowledge should be the main learning aim (ER, EK). In the Design & Technology departments at secondary school E6, skills-based projects were included and emphasised in the curriculum.

> We do projects based on tools and equipment. In a project, they make something but the emphasis is on how they use tools and equipment… we tend to do this in a project using tools relevant to the projects and then the next year, more tools and equipment, so Years 9 and 10 get a greater variety of equipment and tools (ER).

> All the skills you learned in Key Stage 3 will be found in Key Stage 4. The work is more personal with individual outcomes (EK).

Since I understood that English policy emphasised design thinking rather than skilled knowledge, I was surprised to find the time spent for making was equal to or more than

that for designing in all the schools.

Other

One Art & Design teacher emphasized the importance of giving students opportunities to make things by themselves (EU).

> A lot of practice…they just have to play with materials. It has to be hands-on … you have got to provide an opportunity to make something. Not just talk about it (EU).
>
> One Design & Technology teacher emphasised how important it was for students to learn by themselves and from mistakes (EP).
>
> A lot of practice and opportunities to make mistakes. As part of the learning process, you only get better if you make mistakes. If you do not make mistakes, it tends to mean you are not stretching yourself far enough to see where the limit is (EP).

3. 3. 6 Content, activities and teaching and learning strategies for design thinking

3. 3. 6. 1 Design processes

There was an emphasis on teaching design processes in both subjects in the secondary schools in the same way as in the policy documents. Common design processes and stages I observed in two school subjects were: (i) introducing a theme or design brief; (ii) individual research; (iii) generating and developing ideas; (iv) making artefacts or products and (v) self-evaluation. However, the process in Art & Design was more flexible than in Design & Technology, as was the case in the policy documents.

In Art & Design lessons in the secondary schools, students were given a theme or brief first and then asked to investigate artists, artefacts or products, generate ideas, produce

objects and evaluate their work. From my observation of Art & Design lessons, it seemed there was a strong emphasis on individual research, during which students investigated artists and their work using the Internet or books. For example, I saw records of individual research into 'body adornment' in student sketchbooks at secondary school E4 (14/03/06). The students had been asked to research how to decorate the body and drew and collaged ideas before designing and making a fashion bag.

Sketchbooks were displayed at all the GCSE art shows together with final objects. This was interesting to me because I had never seen sketchbooks used in Japan. This was helpful in giving me some ideas about how to teach design processes and the stages in developing design thinking since I was not able to observe a whole project from beginning to end. The common characteristics of the design process and stages as evidenced in sketchbooks used by students in the secondary schools I visited were: brainstorming starting from a given theme/ brief; exploring and gathering data about objects, artists and materials and techniques; making decisions about a final idea; making products and evaluating their individual work.

I studied the way students developed ideas in the sketchbook closely and especially one sketchbook awarded grade A at secondary school E7 (09/05/06). It included some brainstorming starting from the given theme ' everyday scenes'. Next there were some observational drawings of interiors of the student's home including the kitchen and living rooms. At this stage, I could not anticipate which medium she was going to use for an end product at all. After the observational drawing, she wrote down she had decided to

choose ‘a place where my cat sleeps’ for the final idea then she carried out further investigation into possible ways to make this happen. Some experiments with embroidery techniques and practical experiments were presented. Then she made final choices about techniques and materials. At the same time, she researched Satoru Aoyama, a Japanese artist who uses embroidery in his work. She recorded the making process photographically and in writing. Some evaluative comments on her work by other people and a self-evaluation were included on the final page.

I observed students being given a design brief in Design & Technology lessons at secondary school E6 (18/05/06). In the Year 9 lesson on resistant materials featuring jewellery, the design processes on the student presentation sheets were: (i) a design brief; (ii) evidence of research; (iii) a specification; (iv) generating ideas by brainstorming; (v) making and (vi) evaluation. The students following a GCSE course in Design & Technology were expected to follow about ten steps in the design process. At secondary school E6, the textile teacher (ET) told me that GCSE examiners would want to see if all the design processes were included and clearly presented in sketchbooks (18/05/06). The textile sketchbook showed the students included: (i) a design brief; (ii) introduction section; (iii) research (questionnaire and analysis of results); (iv) design specification; (v) initial design ideas; (vi) development of design ideas; (vii) final design; (viii) lay plan; (ix) working drawing and product specification; (x) flow chart of a making process; (xi) research (testing questionnaire) and (xii) an evaluation. I gained the impression that sketchbooks in Design & Technology had to describe the design processes very clearly so that other people could understand them. The design process

and steps I saw being applied in Design & Technology mainly related to industrial forms of production. Probably, this is why the process seemed less flexible than the ones used in Art & Design.

3. 3. 6. 2 Key stages in design processes

I studied the key stages in the design processes more closely in order to understand how to teach them better.

Theme/ design brief

In the lessons in secondary schools, students were given themes/briefs at the beginning of projects. The ones I saw in Art & Design consisted of only a few words or notes and the ones in Design & Technology included lists of essential requirements students had to take into account. Examples of themes I saw in student sketchbooks and provided by teachers in Art & Design as mentioned previously were:

- 'Body adornment' (Year 9 textile)
- 'Natural form' (Year 7 ceramics and mixed media)
- 'Grotesque' (Year 8 mask making)
- 'Location' and 'Everyday scene' (GCSE unendorsed).

According to the teachers, in the controlled GCSE exams, students had to choose one of several given themes only (EG, EK, EO and ER). This seems to be the main strategy used as a starting point or stimulus. The teachers told me that themes they gave students in Key Stage 3 were based on the ones used in past GCSE exams so that they could practise using them.

The design briefs given out in Design & Technology spelt out specific requirements for social needs. The design briefs at Key Stage 4 included more specific requirements

than at Key Stage 3. The teacher (ER) at secondary school E6 told me that all the projects started with a problem (18/05/06). An example is the design brief I saw in a sketchbook for GCSE textiles in the secondary school.

> As a designer, I have been given the brief for this product that I will design and make. A young high street fashion store, Oasis has asked me to design a printed summer shift style dress for their latest collection. Oasis has already decided that it will be part of their promotion and shop window graphics. The dress must be suitable for an age group of 16 – 25 years. It must be made from a fabric which can be dyed if need be. Also, the fabric must be able to be printed on or batik. The style of the dress must be a variation of a shift dress. It must retail for more than 35 pounds. It must use approximately 150 m of material (E6, 18/05/06).

Individual research

In all the lessons, students carried out research activities after they had been given themes or design briefs. Students at Key Stage 3 were taught how to research information and ways of doing this. They were expected to research professional craftspeople and their work.

At secondary school E6, I saw a great deal of research into artists in Art & Design sketchbooks, including the American artist Georgia O'Keeffe and British accessory designers Philip Tracy, Dale Chihuly and Elizabeth Galton (18/05/06) (Figure 3. 5). Although I imagined that students identified relevant artists and their work by themselves, I found out the teachers often selected these artists and gave them the available resources. For instance, possible Internet websites set by teachers were found in handouts about a project. Nonetheless, I discovered that students were expected to learn how to conduct research individually.

In Design & Technology, students were expected to carry out market research and product analysis. I saw evidence of them conducting questionnaires and doing market research in their sketchbooks. The textile teacher (ER) at secondary school E6 informed me her students learned how to carry out 'market research' in shops and how to create consumer questionnaires at Key Stage 3 (18/05/06). In the student sketchbooks I saw that they researched two well-known clothes stores called 'Oasis' and 'Top Shop' to get ideas for their work at school.

At primary level, I only observed group research happening at school E1. I heard the teacher (ED) telling students to use their imagination to produce personal work at primary school E2 (17/05/06). I was surprised that she emphasised the use of imagination to develop ideas.

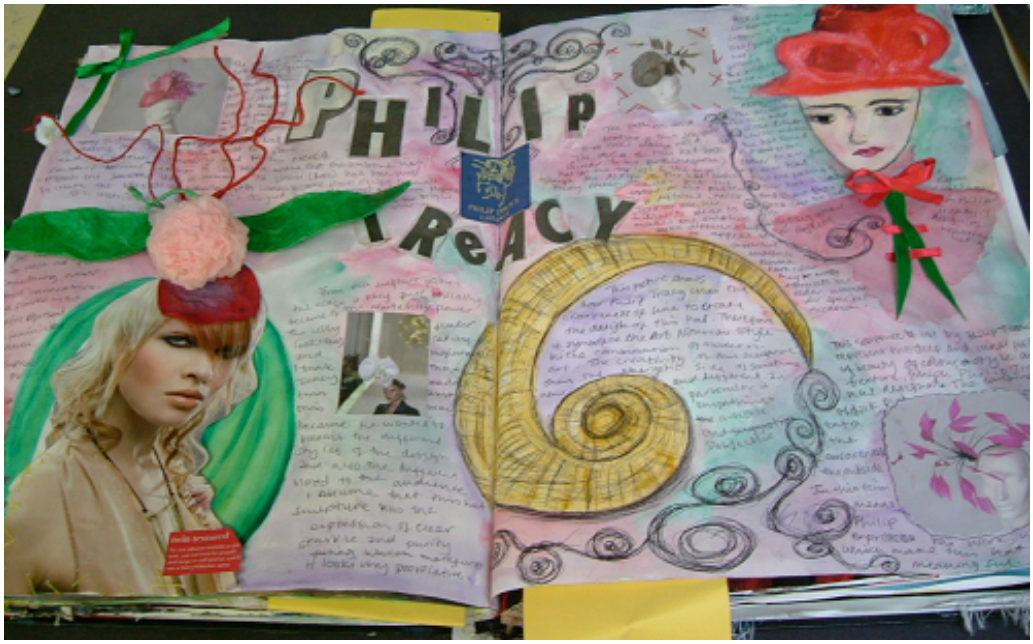


Figure 3. 6: Student sketchbook: researching into Philip Tracy

Evaluation

I observed two main types of evaluation in the secondary schools I visited. One was evaluation of artists and peers work and the other was self-evaluation by students of

their own work. I did not see any evaluation activities actually happening in lessons but I saw evidence of them in students' sketchbooks. Self-evaluation was stressed in the National Curriculum documents for both subjects. There were written self-evaluations in GCSE student sketchbooks for both subjects in all the secondary schools I visited. Although I did not research self-evaluation in-depth, I found that students could explain their ideas and reasons for their judgements about their own and artists' work.

3. 3. 6. 3 Teachers' views

Recurring answers to my question, 'What do you think the most effective ways are of helping students to generate and develop ideas?' were 'showing examples', 'discussion' and 'modelling'.

Showing examples

I saw teachers showing reproductions of artists work in some schools. Some teachers told me that although the best way of developing students' ideas is to show them examples of real objects made by craftspeople, this was impossible at school, so they used reproductions. Using museums and galleries was considered a useful resource because students could see real objects there.

> In a jewellery project, the artist showed her own work. I think it is a starting point. In this handbag project, teachers made examples and showed them. They help students' design ideas and thinking them up. I think it's really good to show other students' work (EG).
>
> It is important because it is so difficult to get to museums and galleries (EU).
>
> The best way is … if you go to exhibitions, if you go to the Crafts Council …seeing actual products rather than seeing photographs…looking at other craftspeople (EO).

Only a few schools I visited organised museum and gallery visits for students even

though there are a lot of galleries and museums in London and they offer education programmes to schools.

Discussion

Two art teachers also identified 'discussion' as a good way of developing students' ideas (EK, EU). One art teacher told me that peer-evaluation and discussing ideas together were effective (EU). 'Evaluating ideas and outcomes through exchanging sketchbooks' was also carried out at secondary school E4.

> It would be talking about ideas. And it would be showing ideas … asking questions to make them to realise what it's about … I would say sharing and talking about ideas (EK).
>
> I always like starting to work with groups and doing pair work to talk about, to discuss and to do peer evaluation of ideas together (EU).

Modelling

Two Design & Technology teachers referred to modelling as an effective strategy for developing students' ideas (EP, EQ). This involved students making small scale or same size products with paper and other materials in advance of a final piece. The teachers told me this is the best way for students to find out if an idea works or not.

> I mean doing it very quickly by sketching and card modelling. That kind of experiment is useful to see if it works or not (EQ).

One Design & Technology teacher (EP) told me that many students were not good at drawing and become frustrated about their lack of drawing skills so modelling was a better way for them to generate and develop their ideas. The teachers told me that using CAD/ CAM to model was a good way of developing design ideas.

> We focus on sketching and drawing ideas but more and more I think students respond to modelling ideas in materials that allow them to quickly generate a

> number of ideas…they can then see what the idea looks like before they make it with real materials. So modelling is more useful. And also 3 dimensional computer modelling allows students to see what the design looks like in 3 dimensions before they start creating anything. Students get frustrated by a lack of drawing skills. They may have an idea that is exciting and different but if they cannot draw it then they will lose interest (EP).

3. 3. 7 Assessment methods

I saw the National Curriculum criteria being used to assess Key Stage 3 work, and the GCSE examination board assessment criteria to assess Key Stage 4 work, in both school subjects. Students' ability to collect and record information, analyze it, generate and develop ideas and evaluate their work was being assessed in both cases. The criteria used in the Art & Design department at secondary school E5 did not identify skilled knowledge clearly. This did not surprise me because the National Curriculum attainment targets for Art & Design did not either. The teacher (EO) at secondary school E6 admitted that lessons at Key Stage 3 were influenced by the GCSE in the way they emphasized design processes. I heard teachers talking about good GCSE work in their lessons and saw displays of course work in all the secondary schools I visited. The teacher (EO) said,

> We are influenced by the GCSE. We don't just look at the techniques involved. We start from looking at where the inspiration comes from, how they recorded their inspiration and how the collected information inspired the craft. So, there is analysis and research for a project. The third thing is the skills they have used, how well they have used them whether they were appropriate for what they wanted to achieve. Finally, we look at the final completed realization…we will see levels of skills involved to create this shape (EO).

The Design & Technology teachers applied the National Curriculum and GCSE exam board criteria to students work for both formative and summative assessment purposes.

They evaluated appropriate and safe usage of tools and equipment more than Art & Design teachers.

> We use the National Curriculum to give us ideas on how to assess students' capability. Obviously, we are looking for high quality products, well considered finished, well made, with attention to safety (EP).
>
> Always look at how they use tools correctly during lessons. How close to what I showed them and check for smoothness and details. It's a bench mark (EQ).
>
> We use a lot of different methods. Mainly written design processes and research, quality of finished work, use of equipment and tools and making skills. We also do formative assessment looking at making and judging it, making notes as we go along. We also do summative assessment (ER).
>
> Quality is important. Some students who work very hard do not produce good quality work. In terms of self-esteem, we make comments. We go around and we use paper work …we have examples of GCSE work and show a grade A piece of work and this is why and we give an A4 sheet, which has GCSE criteria (EU).

It seemed to be important that students produced 'a quality product' in Design & Technology.

Two primary teachers (ED, EE) told me they used the National Curriculum criteria to assess student learning but when I asked them this question about their assessment methods teacher EE seemed uncomfortable.

> When you have little boys who have done something, however simple, how can you assess it? It's an achievement for them, so it's hard to judge them. I assess, in needs, imagination and technical skills in Design & Technology (EE).

3. 3. 8 Resources

3. 3. 8. 1 Accommodation and facilities

A range of facilities was available in the secondary schools I visited in England with several rooms for both subjects but this was not the case in the primary schools. For

example, the Art & Design department at E4 had six art rooms; one big one for textiles, another big room for ceramics, one for general art, two small rooms for textiles and fine art as well as one small dark room for photography. Each room had a small teacher's office inside it and two or three computers. In the big textile room, specialist equipment consisted of six sewing machines, an iron, an area for dyeing, a big sink and several shelves for storing students work. In the rooms for ceramics and sculpture, there were two electric kilns, several shelves for storing tools such as potters' wheels and students' work. At secondary school E6, the Design & Technology department had six workshops including two for resistant materials, two for textiles, one for graphics and one for food. According to a Design & Technology university lecturer who introduced me to this department, the accommodation and facilities there were better than the those in other schools. Primary school E2 had only one small room for both subjects with equipment for cutting and filing. At primary school E3, they were taught in general classrooms. The teachers there told me that they did not like to make the rooms messy because they had to clean them up afterwards for other lessons. I thought this was a constraint. It seemed important that schools had specialist rooms for both subjects.

3. 3. 8. 2 Materials, tools and equipment

In both departments in secondary schools E4, E5 and E8, students were not asked to buy materials and tools. However, some students purchased them for GCSE exams. In secondary school E8, the Art & Design and Design & Technology departments both asked each student to contribute a sum of ten pounds to purchase materials and tools at the beginning of the school year. I witnessed tools, such as brushes and scissors, in poor condition in some schools, particularly the primary schools. For instance, when I

observed a lesson about mask making in Art & Design at primary school E3 (30/06/06), a student asked me to show them how to use scissors to cut the complicated parts. When I did it I was surprised at the poor quality of the scissors. In the end, he gave up trying to cut out by himself and stopped working altogether. This shows how important it is for teachers to provide good quality, appropriate tools for students. The secondary schools had good quality equipment in both departments but this was not the case in the primary schools.

3. 3. 8. 3 Types of teaching resources

I saw some teaching resources made or developed by teachers in some of the secondary schools I visited, for example, at secondary school E4. In this case, they were displayed on a board and created from images in magazines. I also saw a teacher's sketchbook with examples of textile techniques such as embroidery, appliqué, dying and felting and records of exhibitions. At secondary school E5, all the teaching resources were accessed regularly on computer by the teacher. For instance, in one Design & Technology lesson, I observed a teacher using Power Point to demonstrate how things are constructed in the natural and manmade world. In the Design & Technology department at school E6, all the students used workbooks for Key Stage 3 specially prepared in this department. There were pages with spaces for writing down aims for projects, tasks, design briefs, examples of research, working processes and self-evaluations and students were asked to fill in the blanks. In the primary and secondary schools I visited, Art & Design specialist teachers often used exhibition catalogues and books from a bookshelf in their classroom as a resource for their

teaching. In all the primary schools I visited, the teachers used teachers' guides to plan lessons. The classroom teacher (EF) at primary school E3 told me she used the 'Schemes of Work' on the QCA website to plan art lessons. The general classroom teachers in primary schools who did not have specialist training seemed to find this site very helpful for planning lessons as there are no textbooks for art in England.

All the primary schools I visited used artists residences as a resource. I observed two projects involving artists in residences at primary schools E1 and E3. As noted before, the project in primary school E1 was organised by *Making It Work*. The artist worked closely with teachers and students (30/06/06). However, the artist at primary school E3 told me the teachers decided the topic and she was not able to introduce her professional experience or skills into the lessons. It was clear to me that although artists residences are a good thing in principle, it is very important that teachers and artists collaborate well. The secondary schools did not use artists much and told me they did not have enough money for it and the teachers were trained as specialists.

Secondary schools E4 and E5 did not take students to museums or galleries. The reason given was that there was not enough money to organise visits. Although the teachers agreed it would be helpful to show them museums and real objects for motivational purposes, they had confidence in their own teaching skills and resources. One teacher told me she was concerned about student behaviour outside school (EK).

> I think it is very important because pupils don't know even what an art gallery looks like. (EK)

On the other hand, museum and gallery visits took place annually at schools E6 and E7. According to the teacher (EO) at secondary school E6, the Art & Design Department

took students to the Tate Modern in 2005 and the Royal Albert Museum in 2006. He also told me his school strongly recommended students to visit both museums and galleries in their own time, especially older students. I saw museum and gallery brochures in students' sketchbooks, which was evidence of visits in this school. An example of this was a record of visiting the Frida Kahlo exhibition in the Tate Modern in a sketchbook belonging to a student in Year 10. At secondary school E7, the Art & Design and Design & Technology departments organised joint visits at the end of each academic year. This year, they visited the Tate Modern and the Design Museum.

The teacher (EV) in the Design & Technology department at school E8 had invited professional designers to lessons before but said this was not successful because they could not communicate with students. He informed me that the art department often did this and it was successful because artists were more used to working with students than designers.

No visits to museums and galleries took place in the primary schools I visited, according to the teachers. The reason they gave was that it is difficult to find them and there is not enough time. The teacher (ED) at primary school E2 told me she recommended students to visit museums and galleries with parents and mentioned the French artist Henri Rousseau's exhibition at the Tate Modern.

I was impressed by records of the gallery and museum visits in the students sketchbooks and the fact that teachers encouraged them to do this. However, I was also surprised to find these visits did not happen very often on account of the difficulty of organising them and the cost because I knew many museums and galleries provided

education programmes for schools and policy makers recommended their use.

3. 3. 9 Teachers' views of craft education

3. 3. 9. 1 Concepts of craft

I asked teachers 'What comes into your mind when you hear the word "craft"?'

Three teachers referred to practical or tactile aspects (EO, ER, ED).

> The idea of craft is very much hands on, … a hands on approach to the actual making process (EO).
>
> The idea of craft is very much a hands on, practical, skills based thing (ER).
>
> It's practical, tactile and messy (ED).

Two teachers mentioned 'skilled making' (EU, EV).

> It is making things well, as well as making one think (EU).
>
> I think craft is about quality. Craftsmen are highly skilled (EV).

Three teachers mentioned the words 'creative' and 'unique' (EK, EV, EQ, EE).

> It is making handcrafts with creativity and experimentation, and touching something you can feel (EK).
>
> Craftsmen are creative; things become artistic in any materials (EV).
>
> Producing something original and unique (EQ).

Two Design & Technology teachers expressed negative views of the word 'craft' (EP, ER).

> Craft is old-fashioned and lacks originality. Students are designing the same things, the same objects, which teachers have suggested (EP).
>
> I think it's a very old fashioned word. William Morris and Arts and Crafts movement. I don't think we use that word very much now (ER).

One art teacher mentioned how important craft activities were for her at home and included mending things and cooking in her definition of craft (EU).

> My aunt is a great homemaker. She can fix anything and make anything. I am

> always interested in that those kinds of things. I know that craft is very much involved in fine art rather than fixing but I associate craft with a certain degree of skill with objects and understanding of objects. I also associate it with the understanding of materials, food, clay or textiles, with 'craft' meaning being able to create something beautiful (EU).

Listening to what teachers told me, I realised that 'craft' as defined at the beginning in this research did not explain what was happening in English schools and I started to get concerned about this definition. Also, the teachers seemed slightly surprised about my research topic because they said they do not use the term anymore in schools. Some teachers told me they did teach craft but never used the term. This may have been because it was no longer used in the National Curriculum documents.

3. 3. 9. 2 Similarities and differences between craft projects in Art & Design and Design & Technology

I asked teachers 'In your opinion, what are the similarities and differences between craft projects in Art & Design and Design & Technology?' The Art & Design teachers pointed out that Art & Design were more concerned with creativity, individual ideas and aesthetics with less emphasis on skills than Design & Technology (EG, EK, EO, ED).

> In Art & Design craft is arty. It doesn't matter exactly if it's clean or constructed. In Design & Technology it's usually constructed. Art & Design is more about aesthetics and how they look. In Design & Technology, you need to look at skills. In art, it is as well but we don't look at skills very much, more at creativity (EG).

> Art & Design is more related to creativity and conceptual ideas. Design & Technology is more about actual mapping of projects and engineering, making semi-products, something you can sell and use. Functional. Art is more expressive, how you can express yourself … and more the creative side basically (EK).

> In Art & Design we deal more with ideas that we have, with less emphasis on the end product. More freedom and experimentation … less prescriptive (EO).
>
> Accuracy and construction in Design & Technology whereas I (as art teacher) am concerned with the look of things. We don't follow structure or accuracy (ED).

Design processes in Design & Technology lessons were more restricted than in Art & Design (EP, EQ, ER, EV).

> Design & Technology is very much focused on designing for other people. You are designing for clients. Problems are set outside your needs. More links to industry are needed. Students design something to meet a need, whereas what artists create is a secondary feature, rather than the actual selling (EP).
>
> Whereas Design & Technology is more about planning, art is free. It requires lower guidelines in Art & Design than Design & Technology. Rules and accuracy are involved (in Design & Technology) (EQ).
>
> Art & Design is more creative. It is making without going through the process of planning and the use of tools and equipment. We (Design & Technology) are more industry based. We make pupils learn how designers work and plan, how to make and use tools and equipment correctly… In Design & Technology we give them more guidelines, they have more criteria that they have to meet which are close to industry (ER).
>
> We follow a very linear design process. It is very descriptive and less creative, and after 'A' level more creative. Ours (Design & Technology) is about skills as much as the outcome. I think we are less experimental. Art is more experimental (EV).

3. 3. 9. 3 Value of craft activities in schools

I asked teachers 'What do you think the distinctive benefits of including craft activities in school subjects?' Despite the fact that teachers did not use the word 'craft', they told me that it was important to teach it in schools and gave me different reasons.

Three teachers referred to the importance of students learning to make things in terms of their future careers (EP, ER, EV).

> If you are in a position to supervise somebody, whether builders or plumbers, you have to understand how it has been made. Understanding the quality and understanding materials allows you to make a better choice (EP).
>
> If you didn't do that in schools, we would have fewer designers and artists in industry because they wouldn't know whether they liked it or not. So if we stop doing it in schools there will be a shortage of people in these careers. It is also something children enjoy (ER).
>
> I think we need craftspeople and we need creative people in our society (EV).

Two art teachers thought that craft is about enjoyment and appreciation of making (EU, EO).

> …for me, craft is in a way related to art as well. Learning through making. If you are a craftsperson and if you look at children, they enjoy repetitive and careful making. That's my way of teaching craft, appreciation of fine making skills (EU).
>
> It's about the enjoyment of using and working with your hands. It's important to give students that opportunity in the curriculum, an opportunity to show them skills and try out their skills (EO).

Two other teachers mentioned the importance of developing skills for everyday life (EP, EO).

> Obviously, practical skills are important in life. Even if we have to convince students that what they do in the classroom is of benefit for their future life… there is a lot of flat-pack furniture and people need skills to put these together, … when you go to purchase products you must have some views about what constitutes a good design and quality, so I think practical skills make you more informed as a consumer (EP).
>
> Practical skills also connect you to the world around you and the sort of things you use in everyday life because there are less hand-made and very many more machine made products (EO).

One art teacher said that it was important that students understood different kinds of art (EK). Similarly, another one told me that he needed to teach more crafts and his department taught too much fine art (EO).

> I think it is relevant to what we do… there are so many skills … I would say we do making on the artistic side although we don't call it craft when we do these projects, I would say it benefits the students for being creative (EK).

Three teachers referred to craft as a form of personal development (EV, ED, EE).

> Students need self-discipline and have to have it to overcome making properly. It teaches self-motivation, organisation and prepares them for working hard to achieve quality at the outcome (EV).
>
> It's a basic need as a part of development (ED).
>
> It's problem solving and it's good for developing their personality (EE).

Two textiles teachers in Art & Design and Design & Technology told me craft activities were considered 'non-academic' in schools (EG, ER). I was surprised to learn this because I understand craft to require a lot of thinking and learning complicated skills.

3. 3. 9. 4 Combining design thinking and skilled knowledge

I asked the teachers 'In your opinion, what is the best way of combining the development of design ideas and craft skills in craft education?' They all found it difficult to answer this question and the answers they gave were unclear. Perhaps, the question was too direct.

Three teachers told me that it is important to include both design thinking and skilled knowledge in a project in other words, teaching them through project work (EG, ER, EQ, ED).

There is a tension. It's through designing and making in a project (EG).

Teaching them in a project (ER).

Two teachers referred to the importance of including them both in design briefs (EP, EE).

I think that teachers have to give them a set brief (EP).

You have to set a project under design and craft skills (EE).

Two teachers referred to the importance of modelling (EP, EV).

I referred to it earlier, modelling. Students can get 3 dimensional understanding of the products better (EP).

We use card modelling. Rapid prototyping (EV).

One teacher mentioned the need to 'slow down' (EU). She told me teachers have to give students more time to learn them both in craft projects. Another teacher told me that they could be combined after students had acquired the necessary making skills (EK).

3. 3. 9. 5 Working with craftspeople as a form of professional development

I asked teachers 'Do you think it is important to work with craftspeople in craft lessons in relation to your teaching and professional development?' Many of them did not understand that it might be important for professional development reasons but thought it was important for students to see real craftwork being made (EK, EO, EP, EQ, ER, EU, EV). Probably this is because there were several different specialist teachers in each department and they could teach each other. Only three teachers told me it was important for them to learn new making skills and knowledge (EE, ED, EG). However, two primary teachers told me their own skills and knowledge improved when they worked with visiting artists (ED, EE).

> Craftspeople have skills and knowledge, so they help not only children but also teachers like me in broadening my skills and knowledge (ED).

Through the experience she acquired printmaking and papier-mâché techniques.

3. 4 Summary of findings

The term ‘craft’ was used to refer to an art form in the National Curriculum for Art & Design but was not explained. In Design & Technology it was not used at all. The term ‘making’ was used and I consulted it for the term ‘craft’ as used in this research. The teachers I interviewed understood the term in various ways, including practical activities, tactile, creative or unique objects and old-fashioned and not original objects.

The term ‘design’ appeared in the policy documents and was specified as a distinct learning domain. It appeared that generating and developing original ideas in design thinking was promoted in the policy documents and informed the teachers in schools.

The main emphasis in craft education in the policy documents was on developing students’ thinking skills. The justifications for craft education in schools mentioned most by teachers were ‘future careers’, ‘enjoyments of making’ and ‘skills in everyday life’.

The main types of craft materials I identified in the policy documents and in practice were clay, textile and paper in Art & Design and textile, metal and wood in Design & Technology. The craft objects made in Art & Design were the outcome of students’ original ideas but in Design & Technology they were produced for commerce and industry. Crafts from a range of cultures were being taught in schools but there was not much teaching of English craft heritage.

Skilled knowledge was not specified in the National Curriculum very much, especially in Art & Design. Demonstration and observation were understood to be the most effective teaching strategies for transmitting skilled knowledge in both subjects. At Key Stage 3, students accumulated selected craft techniques so as to be able to use them for the national examinations. Too many students in class, shortage of time and lack of professional knowledge might make teaching crafts in schools difficult.

There was a strong emphasis on teaching design thinking in both subjects, more so than on skilled knowledge. Great significance was attached to individual research and self-evaluation in both subjects, particularly, at secondary level. In Design & Technology, the design process was more standardized than in Art & Design and specific themes and design briefs were always handed out at the beginning of projects. I observed the use of sketchbooks in both subjects at secondary level. The teachers considered that showing exemplary work by craftspeople and peers was the best way to help students generate and develop design ideas. Some teachers also identified ‘discussion’ and ‘modelling’ as effective.

All the secondary school teachers in both subjects used National Curriculum assessment criteria to assess student learning at Key Stage 3 and the national examination board assessment criteria at Key Stage 4. National examinations were a significant influence on assessment in secondary schools. I witnessed informal assessment of students’ work going on during craft lessons in all the lessons I observed.

The secondary schools had good accommodation and facilities for both subjects in comparison with Japanese schools but the primary schools did not have enough specialist rooms. The quality of materials and tools provided in some schools was poor. Museum and gallery visits and the use of artists in residence were recommended in the policy documents but did not happen in all the schools I visited. However, the teachers thought it was very important students saw examples of professional work. Artists in residence occurred in the primary schools more than the secondary schools. The primary school teachers I interviewed understood this as a form of professional development. The secondary art teachers created and used their own resources including ‘craft skill files’ and had personal collections of books about artists and exhibition catalogues. The primary school teachers relied on guidebooks to teach crafts. All the secondary schools I visited employed several teachers with first degrees in different art subjects and they organised craft activities using their specialist knowledge.

I gained the impression that the teachers valued skilled knowledge more than design thinking in spite of the policy documents. However, it was clear that design thinking was emphasised more than in Japanese schools.

CHAPTER 4
CRAFT EDUCATION IN JAPANESE SCHOOLS

4. 1 Introduction

This chapter reports the findings from the analysis of the policy documents in Japan and the fieldwork in Japanese primary and lower secondary schools. The first part of this chapter reports the findings from the analysis of policy documents and the second reports on the data gathered during the visits to Japanese schools between November 2006 and April 2007. The findings from the Japanese research in this chapter are compared with the findings from the English research described in Chapter 3.

I analysed policy documents for the two subjects of Art & Handicraft and Art before and during the fieldwork in Japan. During the fieldwork I decided to analyse policy documents for Home Economics and Technology & Home Economics also. This was because some Art & Handicraft and Art teachers pointed out to me that these school subjects emphasised ‘making’ or ‘learning through making’. Another reason was that in the educational reforms of 1969 craft was established within ‘Art’, ‘Technology’ and ‘Home Economics’ (Kumamoto, 1970). Additionally, the teachers whose lessons I observed often referred to Home Economics and Technology & Home Economics when they talked about craft. Unfortunately, there was no time to carry out classroom-based research into these school subjects. I analyzed the policy documents in the hope this would improve my understanding of how designing and making are interrelated in craft education as a whole.

The structure of this chapter largely follows the chronological order of gathering data. The first part reports findings from the analysis of policy documents for 'Art & Handicraft' in primary schools and 'Art' in lower secondary schools. The documents selected were the Courses of Study, a document about improvements to *Shidoyoroku* (assessment reports) and authorised textbooks produced by two publishers.

The second part of the chapter describes the data about Art and Art & Handicraft lessons gathered from fieldwork in Japan conducted between December 2006 and April 2007. The data came from my own observations of art lessons in five primary and six secondary schools in Tokyo and Kanagawa prefecture, two primary school art exhibitions in Tokyo and interviews with four primary and four secondary teachers.

The third part of this chapter reports the findings from the analysis of documents for 'Home Economics' in primary schools and 'Technology& Home Economics' in secondary schools. The documents selected were the same as the ones for Art & Handicraft and Art.

4. 2 Analysis of Art & Handicraft and Art policy documents

4. 2. 1 Background to document analysis

The main aim of the analysis was to identify what theories if any, underpinned policy and what kinds of learning and teaching strategies the documents promoted. The Courses of Study provide the standards for curricula in all Japanese schools. The most recent ones for primary and lower secondary education were published in 1999 and implemented from 2002 onwards. They were accessible from the home page of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on the Internet

(http://www.mext.go.jp) and published, with explanations, in 1999. The Courses of Study for primary and lower secondary schools include *sousoku* (overall aims), contents for all the school subjects, specifications for moral education and special activities. The Courses of Study for 'Art & Handicraft' and 'Art' specify broad and specific *mokuhyo* (aims) for each year group, and curriculum content is divided into two areas: *hyogen (*expression) and *kanshou* (art appreciation). In Art, *hyogen* is further divided into 'activities related to painting and sculpture' and 'design and craft'. Art & Handicraft does not have these divisions.

The document about improvements to *Shidoyoroku* was an official government document published on April 27th, 2001 after the most recent Courses of Studies were introduced. It included assessment guidelines for Art & Handicraft and Art.

Students are required to use textbooks in primary, lower and upper secondary schools and schools for disabled children by the School Education Law (1947) (MEXT, 2010). The copyright of the textbooks must be owned by MEXT or they must be authorized by MEXT. Textbooks are written and published by private sector businesses and approved in accordance with the Courses of Study and Standards for Textbook Authorization through deliberation of the Textbook Authorization and Research Council. Local Boards of Education and Local Authorities determine which authorized textbooks should be used in schools in their locality. In order to realise the concept of free compulsory education, as stipulated in the Japanese Constitution, textbooks used at national, local government and private schools are offered to pupils free of charge. I selected the textbooks used in the school areas I studied to analyse. They were published by

Nihonbunkyo and *Kairyudo*.

I had already developed a list of questions for the analysis of policy documents in England that helped me to identify manifest and hidden inferences to craft. When I analysed the Japanese documents, I revised the original questions to fit this cultural context. In a preliminary investigation of the Courses of Study, I had already established that the Japanese words, *kosaku* and *kogei* were closest to the English words, 'craft' and 'handicraft', respectively, so I focused on them. The list of questions was as follows:

1. How are the concepts of *kosaku* and *kogei* described in the documents?
2. How are skilled knowledge and design thinking described?
3. Which aims are relevant to *kosaku* and *kogei* education?
4. What types of *kosaku* and *kogei* are recommended?
5. Which teaching strategies are recommended to help students manipulate materials and tools and acquire specific craft techniques?
6. What resources are recommended for *kosaku* and *kogei*?
7. Which teaching strategies are recommended to help students generate and develop design ideas?
8. Which evaluation criteria and assessment methods for craft learning are suggested?

The content of the following sections of this chapter are organised under the following subheadings: (i) concepts of craft, design thinking and skilled knowledge; (ii) aims and objectives; (iii) types of crafts; (iv) contents, activities and teaching and learning strategies and (v) assessment.

4. 2. 2 References to craft, design thinking and skilled knowledge

I searched for the concepts of craft/ (*kosaku and kogei*), design thinking and skilled knowledge in the Courses of Studies for Art & Handicraft in primary schools and Art in

lower secondary schools and in the textbooks. I could not find any equivalent words for design thinking and skilled knowledge in Japanese. Therefore, I explored how the concepts of design thinking and skilled knowledge I had defined for this research were described.

4. 2. 2. 1 *Kogei and kosaku*

Kosaku is the closest Japanese term to the English word, 'handicraft'. The Course of Study for Art & Handicrafts used it to refer to making activities together with *zuga*, which means drawing and painting. *Kosaku* was used as a noun but not a verb. There was no definition of *kosaku* and no explanation of how it differed from 'drawing' in this document.

An activity relevant to craft was specified in the Course of Study for Art& Handicraft. It incorporated painting, 3-dimensional work and *kosaku*. In this activity, students demonstrated knowledge of materials, tools and processes and produced objects expressing their own ideas (MEXT, 1999a). Whereas *Kosaku* appeared to be about making activities that used knowledge of materials, tools and processes, it was difficult to determine how it differed from painting and 3-D work. The term *kosaku* also appeared in textbooks for Art & Handicraft. In *kosaku*, students made objects for expressive and aesthetic reasons and explored materials and tools, for example, the material properties of clay (Kairyudo, 2006b). References to *kosaku* in textbooks are explored in more detail later on.

In the Course of Study for Art in secondary schools, the term, *kogei* was used to refer to

one of four art forms. In a previous Course of Study published in 1990, the activities of painting, sculpture, craft (*kogei*) and design were described separately in a section called '*Hyougen*' which translates as 'expression or making' in English (MEXT, 1999b). In the most recent Course of Study (1999b), the same section included '*Kaiga & Choukoku'* (painting and sculpture) and '*Dezain & Kogei'* (design and craft). The reason for this change, according to MEXT (1999b), was to ensure students engaged with a wider range of art media and forms. In the section called *Dezain & Kogei*, *kogei* was used to refer to activities in which students made functional and *utsukushii* (beautiful) artefacts 'creatively' and in a manner that showed knowledge of processes, materials and tools. This was contrasted with self-expression in *Kaiga & Choukoku*. The emphasis, therefore, seemed to be on functional aspects, users, knowledge of materials and tools and making objects in creative ways. In the *kogei* activities included in the textbooks for Art, students were expected to make functional and utilitarian artefacts for aesthetic reasons and for use in everyday life, for example, decorated wooden boxes (Kairyudo, 2006d). *Kogei* is described in more detail in a later part of this section.

Overall, it appeared that *kogei* and *kosaku* were distinctive art forms, which was not the case with craft in the English National Curriculum Courses of Study. Both *kosaku* and *kogei* commonly emphasised knowledge of how to manipulate materials, tools and processes.

4. 2. 2. 2 Design thinking

The term *dezain* (design) was used as a noun in the Courses of Study for both subjects although its meaning was ambiguous. Therefore, I searched '*Kaisetsu'* (government

explanations of the Courses of Study). I also studied the Courses of Study to find out what concepts underpinned them and whether or not they mentioned generating and developing unique or individual ideas.

The Course of Study for Art & Handicraft (MEXT, 1999a) specified competence in *dezain* in *Kaisetsu* and explained its relationship to creativity as follows:

> Design is creative competence at making things with own ideas when students identify what they want to make, take into account beauty and function, plan forms of expression, and prepare necessary materials and tools; and this competence is used in all the processes of making.
>
> デザインの能力は、つくりたいものを見付け、美しさや用途などを考え、表し方を構想し、必要な材料や用具を探し、造形活動を進める全過程に働き、自分の良さを生かしてものをつくりだす創造的な能力のことである。(MEXT, 1999a; 68)

I also found explanations of the meaning of ‘creative handicraft’ and ‘competence in creative handicraft’ in the objectives for the Course of Study for Art and Handicraft (MEXT, 1999a; 66). Creative handicraft activities were understood to require skills such as manipulation of materials and design and the competence to make something after choosing a theme for a piece of work (MEXT, 1999a; 66). They were about making and designing something through developing one's own ideas. Creative handicraft involved design thinking and skilled knowledge in the way I had defined them at the beginning of the research.

I could not find any references to individual research or self-evaluation. In the Japanese curriculum, Art Appreciation is separated from Expression but it is expected that they will be taught together during projects (MEXT, 1999a). Developing ways of looking at the nature and objects and responding to them emotionally and subjectively was

mentioned in Art Appreciation. Whereas this could be interpreted as a form of self-evaluation it was a different use of the term from England.

The term '*dezain'* did not appear in the textbooks for Art & Handicraft. Instead the emphasis was on students expressing their own ideas through exploring and experimenting with materials and tools. For example, they could make whatever they wanted through exploring and finding interesting shapes in clay (Nihonbunkyo, 2006a). I obtained the impression students were expected to develop design ideas through exploring materials.

In the Course of Study for Art, generating and developing unique ideas was specified as a competence for '*dezain* and *kogei'* activities (MEXT, 1999b). The emphasis was on developing competence in generating creative ideas taking into account users, function and inspiration from dreams and imagination.

> Students should make craft works and in doing so explore individual ideas taking into account fundamentally, function, individual imagination, beauty, and how to manipulate materials and tools.
>
> 使用するものの気持ちや機能、夢や想像などから独創的に発想し、造形的な美しさ、材料や用具の生かし方などを総合的に考え、創意工夫して作ること。(MEXT, 1999b; 73)

Self-evaluation was not mentioned as part of the process of developing personal work unlike England. In the section about Art Appreciation in the Course of Study for Years 2 and 3, it was stated that students should understand the importance of both contemporary and traditional design and craft and develop aesthetic sensitivity.

> Students should develop a personal aesthetic sense and the competence to make judgements of aesthetic value by feeling the beauty of fine design in contemporary and cultural heritage.
>
> 現代及び文化遺産としてのデザインの洗練された美しさなどを感じ取り，自己の美意識

や美的選択能力を高めること。(MEXT, 1999b)

The term *dezain* appeared in all the textbooks for Art. It was understood to mean planning functional products for commercial and industrial use or for expressive and aesthetic reasons. For example, in a *dezain* project in one textbook, students designed and made products for disabled people such as spoons (Nihonbunkyo, 2006d). The emphasis was on producing ideas for products, not making them. Group and individual research and reflection were mentioned but not elaborated.

4. 2. 2. 3 Skilled knowledge

The term 'skilled knowledge' was not included as such in any document. Therefore, I explored implicit references to it in the Course of Studies and textbooks. The Course of Study for Art & Handicraft mentioned 'generating ideas considering the characteristics of materials' and 'developing competence in creative craft' as key learning objectives (MEXT, 1999a). A section about the content of craft activities in this document contained the statement that students should be able to make artefacts using knowledge of materials and tools learned in previous years, consider their choice and develop their own ideas (MEXT, 1999a). The Course of Study for primary schools stated that students should acquire both theoretical and practical knowledge of materials, tools and processes, and that this knowledge should be acquired while they developed abilities in generating and developing unique ideas.

A section called '*Dezain & Kogei'* in the Course of Study for Art (Years 2 & 3), stated that students should 'make objects creatively and consider … effective ways of using materials and tools (材料や用具の生かし方などを総合的に考え，創意工夫してつくること)'

(MEXT, 1999b; 57). MEXT explained that students should develop a competence to make aesthetic judgements through making craft objects (1999b). In addition, it explained that students in Years 2 & 3 should be able to engage in making activities in depth using selected materials and tools (1999b; 76). In-depth engagement with materials was a requirement for secondary school students.

Knowledge of materials, tools and processes was included and emphasised in both *kogei* and *kosaku*. The Courses of Study stated that motor skills should be developed through making and that students should choose what they wanted to make. However, the statements about knowing how to manipulate materials, tools and processes did not fully explain the nature of skilled knowledge as defined in this research because as Gardner explains it involves thinking skills as well as knowledge of tools and materials (1990).

4. 2. 3 Aims and objectives

At first, I looked at the general educational aims common to all school subjects and then the aims of Art & Handicraft and Art because I though they might influence how craft was taught. In the Courses of Study, the main emphasis in all school subjects was on developing students' *ikiruchikara* (zest for life), which translates into English as something like autonomous learning (MAXT, 1999a, 1999b). The stated educational aim in all subjects was to foster character development, for example, to cultivate *yutakana ningensei* (a rich personality). Cultural policy was about understanding Japanese culture, in particular.

As *kogei* and *kosaku* did not have specific aims, I had to investigate the broad aims in the Courses of Study for Art & Handicraft and Art and speculate how they influenced teaching and learning in *kogei* and *kosaku*. The main aims for both Art & Handicraft and Art were that students should experience the enjoyment of creating and appreciating art and come to love it, develop basic competences in making art and cultivate aesthetic sentiment. 'Enjoying making and art appreciation' and 'cultivating aesthetic sentiment' were not mentioned in any English curricula.

> Through activities designed to stimulate expression and appreciation, the overall goal is to enable children to feel the joy of artistic creation (making) and to love art, to develop while fostering sensibility, the ability to engage in creative plastic arts and nurture a rich fund of aesthetic sentiment.
>
> 表現及び鑑賞の幅広い活動を通して、美術の創造活動の喜びを味わい美術を愛好する心情を育てるとともに、感性を豊かにし、美術の基礎的能力を伸ばし、豊かな情操を養う。
>
> (MEXT, 1999b; 7)

Under the main aim there were three aims for Art & Handicraft and Art. They were (i) cultivating a love of art, (ii) developing competence to make and create things and (iii) in art appreciation (MEXT, 1999a,b). The first one emphasised fostering positive attitudes to art and getting students interested in making art creatively.

The second aim related specifically to making in both subjects. For example, in Art & Handicraft was that;

> Students should be able to develop competence in creative plastic art (making activities), design and creative handicraft by coming to understand the characteristics of materials, considering how to represent a theme using their imagination and concepts of beauty.
>
> 材料などの特徴をとらえ、想像力を働かせて主題の表わし方を構想するとともに、美しさなどを考え、創造表現の能力、デザインや創造的な工作の能力を高めるようにする。
>
> (MEXT, 1999a; 66)

The second aim in Art for Years 2 and 3 was that;

> Students should develop the competence to generate and develop ideas imaginatively and express (make) things creatively.
> 豊かに発想し構想する能力や自分の表現方法を創意工夫し創造的に表現する能力を伸ばす。(MEXT, 1999b; 13)

I gained the impression that developing design ideas and making skills together was the main concern in both subjects. This implies students should be able to devise their own ways of expressing artistic ideas. It appeared that generating and developing ideas imaginatively was the main concern in learning to make.

The third aim referred to art appreciation. At first, I did not think this was relevant to research into craft education because the focus was on 'looking and understanding art'. However, the review of literature had indicated that looking at craftwork enables students to develop design ideas and learn techniques. The Course of Study for Art and Handicraft stated that students should be able to 'appreciate art works autonomously, experience them aesthetically, and cultivate aesthetic sentiment' (MEXT, 1999a). In Art, the third aim for art appreciation stated that students should: (i) understand nature, artefacts and cultural heritage, (ii) become interested in relationships between life and art and (iii) appreciate good taste, goodness and beauty (MEXT, 1999b). I gained the impression that art appreciation was viewed as a passive activity by Japanese policy makers in the sense that students come to understand values that already exist and are embedded in aesthetic objects rather than in the experience viewers bring to bear on them.

4. 2. 4 Types of craft

Very few materials and tools were named in the Courses of Study for Art & Handicraft and Art. The document for Art & Handicraft, mentioned electric saws and using materials students had chosen and had worked with in previous years, and recommended the use of 'familiar materials and tools' that can be handled easily. Local materials were recommended for both courses. The section titled *kogei* in Art included the suggestion that students use and learn about clay, stone, Japanese paper, wood and bamboo (MEXT, 1999b) and materials used for traditional local crafts and *mingei* (folk arts/craft).

I examined some textbooks for Art & Handicraft for (Years 5 & 6) for primary schools and Art in secondary schools, which contained more detailed information about materials and techniques than the Courses of Study. The ones for Art & Handicraft did not divide art forms into 'painting and sculpture' and 'design and *kogei*/crafts', so I was not able to determine what materials, tools, equipment and techniques were recommended specifically for 'craft activities' (kairyudo, 2006a,b, Nihon Bunkyo, 2006a,b). The textbooks for Art & Handicraft named several materials, tools and equipment. The materials mentioned were: paper (e.g. tissue and card); wood (e.g. bamboo); clay; plastics; metal (e.g. aluminium and wire); cloth and others (recycled materials, leaves, stones and shells). The tools and equipment named inclued: pliers; nippers; wire cutters; saw and electric saws; hammers and screwdrivers for carpentry; brushes for painting; chisels for carving and computers. The techniques explained were for: pop-up cards; carpentry; print making (wood prints); dying; pottery and photography. The textbooks had sections with detailed instructions about how to use tools and make

artefacts in certain ways, for example, how to make a ceramic doll using a slab technique (Kairyudo, 2006a; 21).

The textbooks for Art were organized differently and had a separate section for '*Desain* & *Kogei*' (design & craft) (Kairyudo, 2006c,d,e, Nihon Bunkyo, 2006c,d,e). I looked at general information about materials, tools equipment and techniques first, then at the pages set aside for *Desain* & *Kogei*. The materials specified for Art were similar to those recommended for use in Art & handicraft and included: paper; wood; clay; plastic; metal; cloth; glass and others (recycled materials, leaves, shells and stones). Materials specified in the pages set aside for *Desain* & *Kogei* were: wood; stone; paper (including Japanese paper); clay; cloth; metal; plastic and glass. Tools and equipment for '*Dezain* & *Kogei*' was not specified. A wide range of techniques for making were identified and described in the textbooks. They included: paper craft techniques, techniques associated with print making (e.g. making for wood printing, silkscreen, etching and dry-point); carpentry; textile crafts (e.g. dying); ceramics; photography; paint making including Chinese and Japanese painting and animation techniques. Techniques identified and described in 'Dezain & *Kogei*' were: pottery/ceramics (*tebineri,* coiling*, itazukuri,* mosaic); carpentry; carving; textiles; paper craft; basket making; animation and typography.

4. 2. 5 Content, activities and teaching and learning strategies

I searched for references to content, activities and teaching and learning strategies for craft in all the documents. The Course of Study for Art & Handicraft for primary level explained that developing 'competence in creative handicraft' does not mean that

students should make things passively and it is important that teachers ensure they enjoy craft and try out new ideas (MEXT, 1999a). However, there was no guidance for teachers as to how to combine learning to make with trying out new ideas. For all the making activities, it was suggested teachers offer students a choice of materials, give them opportunities to learn from each other, allow them to do experimental work, and teach them flexibly and creatively (1999a; 75). In addition, teachers should consider the development of student learning sequentially through Years 5 & 6 rather than plan lessons for one year only. Visits to museums and galleries and artist and artisan workshops outside school were recommended together with residencies in school classrooms, and particularly, the use of local resources.

In the Course of Study for Art, 'student-centred teaching', 'offering students choices', 'group work' and 'critical activities' were recommended strategies for all making activities (MEXT; 1999b; 105). Additionally, visits to museums and galleries and artists' workshops, and use of artist-in-residencies were recommended.

The textbooks for primary school included examples of projects. Each project had a title and sub-title and the content was summarised in a short sentence or phrase indicating an intended function, rather like an English 'design brief but more open-ended. For example, one pottery project for Years 5 and 6 (1), was entitled 'Bend and twist (曲げて、ねじって)' and included the statement 'Let's make various shapes of clay boards, and bend and twist them! (いろいろな形の粘土の板をつくって、曲げたり、ねじったりしてみよう。)' (Nihonbunkyo, 2006a; 20) (Figure 4. 1). Project titles and summaries were presented in a similar way in another textbook. Prompts for students' '*Kufuu'* (invention),

and '*Furikaeri*' (reflection) were listed. For example, one suggestion for '*Kufuu*' for a pottery project was, 'what shape shall I make by combining lumps of clay? (くっつけてどんな形をつくろうかな。)'. There were also some warnings about safety and suggestions for 'cleaning and tidying tools and the art room after lessons finish', together with many detailed technical instructions for making. Different ways of shaping clay were explained very precisely in pictures and words for pottery projects, (e.g. thumb, slab, and coil techniques) and methods of bonding clay together with *dobe*, clay water (2006a; 20).

Figure 4. 1 Clay project: 'Bend and twist' (Nihonbunkyo, 2006a; 20)

The Courses of Study and textbooks included instructions for collaborative as well as individual projects. For example, in one project called 'Gather dreams (夢を集めて)', students were encouraged to collaborate on making a large flag or wall painting (Nihonbunkyo, 2006b; 28). Discussing completed work with other students was recommended, especially at the end of projects.

The textbooks contained guidelines for museum and gallery visits as well as visits to artist workshops and how to learn from them. One textbook referred to a visit to the

Munakata Shiko memorial museum where students listened to the curator's explanations of artworks (Kairyudo, 2006b; 42). The stated aim for these outside school activities was 'to understand art in everyday life', rather than develop personal ideas.

The textbooks for secondary schools contained many examples of projects with titles and briefs (descriptions of projects) and included explanations of exemplary works by students and professional artists and teaching suggestions. One project called 'enjoyment of hand-making (手づくりの楽しみ)' had a separate section for Design and *Kogei* (Nihonbunkyo, 2006d; 20, 21). The subtitle was 'Let's create things that will make life graceful and give it colour - making by hand (手づくりのよさを生かして、生活に潤いや彩りを与えるものをつくろう。)' and the introductory description was;

> There are lots of products made by machines around us. An advantage is that we are able to have things of the same quality. However, we respect hand-made products. Let's design and make things so we can live better that consider the characteristic of materials.
>
> 私たちの身の回りには、機械によってつくられた製品があふれています。それらの製品には、多くの人が同じものを手にすることができるという利点があります。しかし、私たちは、作り手の息遣いや手のぬくもりが感じられるような手づくりのものにあこがれる気持ちもあります。生活に潤いや彩りを与えるものをデザインし、身近な素材を生かして制作してみましょう。(Nihonbinkyo, 2006d; 20)

This textbook included pictures of a wooden musical box made by an artist and four related student works; a bamboo vase, a metal object, wooden plate and wooden relief box. One exemplary project subtitled 'Let's make a coaster (コースターをつくろう)' included five examples of student work using various materials and techniques (Nihonbinkyo, 2006d; 20). In addition, it included an image of a traditional Japanese

craft called '*Bingata* (紅型)' produced and used in Okinawa prefecture. This example was included for the purposes of art appreciation (Nihonbinkyo, 2006d; 20).

Another project in the section '*Desain* (design) & *Kogei*' was titled 'A comfortable design for everybody (だれもが快適なデザイン)' (Nihonbinkyo, 2006d; 22, 23). It emphasised considering function, sketching and modelling ideas and making prototypes. This project, clearly specified methods of design research which were rather like those I had seen in England. It recommended that students investigated products and environments from both maker and user viewpoints and reported the results in sketches and photos. Perhaps, this is because this particular project focused on 'industrial design'.

Because the Japanese textbooks included a lot of information I studied them a second time in more depth. Specifically, I looked at: (i) how the contents were organised, (ii) project titles and themes, (iii) types of projects and (iv) exemplary work. The contents of textbooks for both subjects were organised around the aims and objectives, learning activities and assessment criteria stated in the Courses of Study and the notification for improvement to *Shidoyoroku*. For example, the contents of the textbooks for Art were organised into three expressive areas of painting & sculpture, design & craft and art appreciation. In the textbooks for Art each project had specific objectives. For a project called 'Fascinating materials (素材の魅力)', they were: (i) 'Let's get interested in characteristics of materials (素材の特徴に関心をもとう)'; (ii) 'Let's generate ideas from touching and experiencing the texture of materials (素材の手ざわりや材質から発送してみよう)'; (iii) 'Let's think about effective ways of using each material (素材のいろいろな特徴

を効果的に生かす方法を考えよう)' and (iv) 'Let's appreciate artworks by considering effective ways of using a material (素材の特徴の生かし方を大切にして作品を味わおう)' (Kairyudo, 2006c; 22). The content of the textbooks for Art were organised around four broad criteria for assessment identified in the notification of *Shidoyoroku*: (i) 'interest, enthusiasm and attitude (関心, 意欲, 態度)'; (ii) 'generating ideas and design/plan (発想、構想)'; (iii) 'creative skills (創造的な技能)' and (iv) 'art appreciation (鑑賞)' (Kairyudo, 2006c; 2).

The titles and brief introductory explanations of projects used in the textbooks were used fanciful, metaphorical language. Examples were 'Layer colours and expand your dreams (色を重ねて、夢を広げて)' (a print making project) (Kayrydo, 2000a; 30) and '*Yura, yura, kuru, kuru* (ゆらゆらくるくる)' (a toy making project) (Nihonbunkyo, 2006b; 14), 'Making with fire and heat (炎と熱でつくる)' (a ceramic project) (Kairyudo, 2006c; 30, 31) and 'Enjoying making with my hands (手でつくる楽しみ)' (a clay project) (Nihonbunkyo, 2006d; 20, 21).

One difference between the use of exemplary work in the primary and secondary schools was that there were more examples by artists in the secondary school books and more by students in the primary ones. The artists' work was from different times and places. Examples of traditional Japanese art and craft were evident in sections dealing with Expression and Art Appreciation and especially in the special section for craft in the secondary textbooks. There were some examples of contemporary craft work in primary textbooks including: 'Mountain, glass, flower, earth', a ceramic tile made by Kiyoshi Awazu in 1998 (Kairydo, 2006a; 3) and '*Edanoana'* a wood sculpture made

by the British artist, Andy Goldsworthy in 1991 (Kairyudo, 2006b; 3). Examples of Japanese traditional artefacts were '*Kokeshi',* a wooden doll made in Miyagi, '*Mashikoyaki',* a kind of ceramics produced in Tochigi prefecture and '*Tosawashi',* Japanese paper made in Kouchi (Nihonbunkyo, 2006a; 37). Examples of craft artefacts in the secondary textbooks were: '*Yoenka*', a textile hanging created by Miyako Hanashiro in 1993 (Nihonbunkyo, 2006c; 9); 'Lion', a wooden animal doll made by Aoi, Nakamura in 2002 (Nihonbunkyo, 2006d; 20) and '*Tokikaki*' a ceramic sculpture by Hiroshi Teshigawara in 1990 (kairyudo, 2006d; 31). Some examples of Japanese traditional crafts were '*Tsugaru nuri*', wood and lacquer work made in Aomori, '*Bingata*', dyed textiles made in Okinawa and '*Edofurin*' a kind of a glass bell made in Tokyo (Kairyudo, 2006d; 34, 35).

Photographs of students participating in lessons were included in the primary school textbooks together with final pieces of work. More examples of completed work by artists and students were included in secondary school textbooks and more making were illustrated in the primary school textbooks. The exemplary work by students in the textbooks was skilfully made. At primary level, the exemplary craft objects were playful, whereas at secondary level, objects made of wood, metals or textiles were simple with minimal decorations (Figure 4. 2).

Figure 4. 2 Student work: relief box (Nihonbunkyo, 2006d; 20)

There were more visual images of craftwork in the Japanese textbooks than in the schemes of work in England. However, the aims and learning activities were described more fully in the English schemes of work. Making was mentioned more than any other kind of activity in both textbooks in Japan. One textbook for Art, published by Kairyudo in 2006d, outlined eighteen projects in details, fifteen of which were for making activities and the remaining three were for art appreciation. There was more emphasis on making in Japan therefore than in England.

4. 2. 6 Resources

The visual resources mentioned in the Courses of Study and textbooks were very varied. In ‘Art Appreciation’ in both primary and secondary schools, students were expected to investigate art, craft and design works from Japan and other countries. Museums and galleries were suggested as possible sites for visual resources in the section for Art Appreciation.

4. 2. 7 Assessment

I studied the documents of improvements to S*hidoyoroku* (MEXT, 2001) for all Boards of Education in order to investigate policy related to methods of evaluating student learning during craft activities in schools. Assessment methods and criteria for each subject and school year were stated and explained in the document. Although I call them criteria here, they were not the same as the ones used in England, which specified learning outcomes. In Japan, they described aspects of student performance, behaviours and preferred learning outcomes that teachers and schools should think about when they graded students' work. According to MEXT (2001), teachers were supposed to use the objectives stated in the Courses of Study to assess student-learning. The documents also suggested they should assess '*Gakushu no joukyou* (student learning conditions)'. However, schools and teachers were permitted to add their own evaluation criteria to the standard ones. Japanese schools have two or three terms a year and assessment of school work is a requirement at the end of each one. Student outcomes is graded as follows: A = good, B = satisfactory/ fair, and C = needs to make more effort (MEXT, 2001). Student achievement is also assessed and graded on a scale of 1 to 5 at the end of each school year.

Four criteria were specified in the documents for Art & Handicraft and Art (MEXT, 2001). They were: (i) interest, enthusiasm and attitude towards art; (ii) competence in generating ideas and planning; (iii) creative skills and (iv) competence in art appreciation. One main difference from England was the emphasis on student 'interest, enthusiasm, and attitude'. On reflection I was surprised the English curriculum

documents did not include this because it was considered so very important in my own studies and training to become an art teacher in Japan. Another difference was there were no standardised level descriptors or ‘attainment targets’ in the Japanese documents. I realised it would not be possible for me to fully understand how teachers graded student work without asking them.

The first criterion for assessment for Art & Handicraft and Art in the document referred to autonomous learning and enjoyment of making and art appreciation (MEXT, 2001). At secondary level, teachers were expected to foster not only student enjoyment but also a love of art that lasted throughout their lives. According to Dissanayake (1988) and Csikszentmihalyi (1996), the pleasure of making is the basis for all craft and creative activities. However, I am not sure how teachers can apply an assessment criterion that refers to subjective impressions and feelings.

The second criterion was competence in designing/ generating and planning (MEXT, 2001). This was synonymous with the concept of design thinking developed for this research in that it referred to the process of generating and developing ideas. Students in Years 5 and 6 in primary school were expected to;

> To be able to design/generate and plan unique forms of making based on what they look at and experience using imagination and considering what they want to make and beauty.
>
> 発想や構想の能力；見たことや感じたことなどをもとに想像力を働かせ，主題の表し方など自分らしい表現の構想をしたり，デザインの能力を働かせて，つくりたいものの意図や美しさを考えるなど豊かな構想をしたりする。(MEXT, 2001; Appendix I)

In Years 2 and 3 in secondary schools, students were expected;

> To be able to generate and develop unique ideas and to plan creative

expressions using their own sensibility and imagination, by looking at objects, experiencing their beauty, and considering their uses and functionality.

感性や想像力を働かせて，対象やものごとを深く見つめよさや美しさなどを感じ取ったり考えたり，用途や機能を考えたりして，独創的で豊かな発想をし，心豊かで創造的な表現の構想をする。(MEXT, 2001; Appendix II)

The Courses of Study for both subjects emphasised the importance of generating unique ideas and expressing them creatively. However, these criteria did not cover communicating ideas or evaluating students' own and other work, as was the case in English policy.

The third criterion referred to ‘Creative skills (創造的な技能)’ (MEXT, 2001). It focused on making things creatively and seemed to be linked to notions of design thinking and skilled knowledge as defined and discussed in this research. In Years 5 & 6, students were expected;

To be able to express their own ideas creatively considering what they want to do and the environment surrounding them using creative skills or sense of making.

表したい意図や周りの様子に関連付けながら，創造的な技能を働かせたり，造形感覚を生かしたりして，表し方を工夫する。(MEXT, 2001;Appendix I)

Again, I did not understand what ‘creative skills’ meant and could not find an explanation.

The fourth criterion referred to art appreciation. For example, in Art for Years 2 & 3, students were expected;

To become familiar with nature, art work, objects in everyday life, culture and cultural heritage, and understand their beauty, and the makers’ intentions, unique ways of making, and creativity.

自然，美術作品や生活の中の造形，美術文化や文化遺産などに親しみ，感性や想像力を働かせてよさや美しさ，作者の心情や意図と表現の工夫，創造力の豊かさなどを感じ取り味わったり，理解や見方を深めたりする。(MEXT, 2001; Appendix II)

Unlike England, students were commonly expected to become familiar with nature, art works, objects in everyday life and cultural heritage and experience their 'beauty' as well as understand the makers' intentions and modes of expression. The focus was more on understanding 'great masterpieces' of art rather than evaluating their own or other's art.

4. 3 Fieldwork

4. 3. 1 Background to fieldwork

This part of the chapter describes the data about craft education practice in the school subjects of Art & Handicraft in primary schools and Art in secondary schools, as was the case in England. The main aim of the fieldwork was to understand craft education practice better and compare it with policy.

I visited a total of five primary schools and six lower secondary schools to observe craft lessons for about six days each (Appendix XII). I also visited two school art shows at primary schools but I did not observe lessons there. The following account is based on data obtained from the classroom observations, interviews with four Art & Handicraft teachers in the primary schools and four Art teachers in the secondary schools and from an analysis of school documents. I describe examples of craft projects, types of craft, teaching strategies, assessment methods, teaching styles, resources, and teachers' views about craft education.

4. 3. 2 Examples of craft projects

This section reports on the main characteristics of and two examples of craft projects in Japanese schools. In the primary schools I visited, around two hours per week was

allocated for Art & Handicraft and in the secondary schools, two hours for Year 1 was allocated in Art and one hour for Years 2 and 3 per week. It was not taught on a regular basis every week and sometimes only for one hour in Year 1. I did not see any schools organising art lessons intensively at certain periods of the year as was the case in some English schools I visited.

More projects were completed in the primary than secondary schools. About ten projects were timetabled per year in Years 5 and 6 in primary schools, and about two to four projects each year in secondary schools. For example, in Years 5 and 6 I was told ten projects were conducted per year in primary school J2. In Year 1, 2 and 3 four projects were completed per year in secondary school J8. However, in the school subjects for Year 2 in one secondary school J9, students only completed one project in 2006-2007. This was the case with secondary schools J10 and J13. I was surprised to find they conducted so few projects. The teacher at secondary schools J9 told me students explored their own ideas more than in the past and craft projects require technical learning which is difficult so this explains why they take longer to complete in secondary schools (21/02/07). Whereas the length of projects varied in the primary schools, in the secondary schools, one project lasted about twelve to fifteen hours and was taught over one term. The longest project lasted twenty hours in secondary school J9 and the shortest lasted two hours in primary school J2.

4. 3. 2. 1 A craft project in Art

At secondary school J11, I observed a craft project in Art for Year 1. The participants were the teacher (JI) and forty girls. The project was called 'Making *nabeshiki*' (a pot

stand). I observed it for four days from January to March 2007 (19/01/07, 26/01/07, 16/02/07, 02/03/07). It was scheduled for approximately eighteen hours over a period of about ten weeks and lessons took place every Friday morning.

As I did not observe the first lessons, I asked the teacher to tell me about them on my first visit. He said he had explained the project and shown exemplary work made by previous students (Figure 4. 3). The learning activities focused mainly on designing and making a pot stand constructed from a tile set in a wooden frame. The students were asked to design a tile using their own initials. They were also asked to design a frame. At the beginning of the project, he taught them some carving techniques and gave out an instruction sheet. He asked the students to practice various carving techniques on a small piece of wood - in other words learn through doing.

The heading on the instruction sheet was 'practising basic carving techniques'. It included pictures of carved objects and how to do them. The five carving techniques it explained were; *katagiri bori, yagen bori, hishi bori/hishiai bori, kamaboko bori* and *uki bori*. The carving techniques and how to use tools were explained step-by-step and the handout included diagrams and words. In addition, he showed the students photographs of finishing artefacts to help them understand how these techniques had been used and gave them another handout about design. The title on this was 'Year 1: Ideas for *Nabeshiki*'. It included the following guidelines:

> 1. Tile design (タイルのデザイン)
> Let's make patterns based on your own initials. (自分の名前のイニシャルを装飾して模様にしよう)
> *You will be asked to scratch into the part of tile you want to make white. (白くしたい部分をニードルで削ります)

2. Decoration of frame (額縁の装飾)

①. Design geometric patterns (幾何学的な模様にすること)

②. Generate ideas considering kinds of carving techniques (削り方の種類を考えてデザインを考える)

③. You can change the shape of the frame by cutting off the edges (3 examples). (外側の形を切り取って良い)

④. You should show clearly where and how intend to you carve. (削るところを鉛筆でぬってわかりやすくすること)

⑤. You are allowed to use colours. (色をぬっても良い)

The worksheet also included a space for a final design idea.

The students made the pot stands out of clay and wood. The techniques employed were cutting and carving wood. Readymade pieces of tile had been purchased from a commercial supplier. The students had to create a design and draw it on the surface of a tile and the company fired them.

In all the lessons I observed, he always started by explaining learning objectives written on the blackboard, for example, 'For cutting wood to make a frame, deciding on a design and tracing it' (19/01/2007). I was surprised how detailed the explanations were for making and designing. My impression was that his teaching was very thorough. In the lessons I observed, the main activity was making the frame. The students had to cut a piece of wood at an angle of thirty degrees with a saw. The teacher asked them to work in groups of three to help each other. They collaborated well and supported each other by holding pieces of wood and saws. It seemed to be a difficult job to cut the pieces accurately. In fact, some of them could not do this the first time and had to cut them again. I saw the teacher help one student cut a piece of wood shorter because the work was too difficult for her. He told me that he preferred students to practise

themselves until they get something right but did not like them to fail. In addition, he informed me there was not enough time or material to make artefacts in class by trial and error. When I heard this, I thought it must be difficult for students to develop skilled knowledge this way since it is learned through experience and repetition (Ikuta, 1987). It was very noisy in the art room during lessons on account of the saw and students' chatting but the atmosphere was lively.

In this project, designing the pot stand was set as a homework task. I saw the teacher check the students' design sheets during lessons focusing on cutting wood. He frequently pointed out whether their design was feasible or not, gave suggestions and used exemplary work to help them understand design problems. He told all the students to complete their design plans carefully so he and other people could understand them. Listening to this, I remembered the sketchbooks used for Design & Technology in England which resembled designers' presentations to clients. I saw some students erase memos and initial ideas from worksheets so I observed final design ideas only not the process of development.

I was interested to find out was about the source of their ideas. According to the teacher, he explained the design task at the beginning of the project. Some of his students had studied Islamic patterns in the past to help them generate and develop ideas but there was not enough time for it this year. Several students told me they used their imagination to generate ideas and did not study any exemplary work. Their design work was rather simplistic and the teacher did not give them much advice. All he said was, 'please make your design simple' (シンプルなデザインにしなさい) (16/02/2007). I was

unable to find ‘students’ own ideas’ in their work unlike England. I did not really understand how they developed ideas for this project but suspect the exemplary work was influential.

In the third observation (16/02/2007), the students completed constructing the frame and design plan as well as starting to decorate the surface of the tiles and the frame. The majority could not carve the frames well because they did not know how to use chisels correctly. I frequently observed them using tools incorrectly and showed them how to do this for safety reasons. The teacher was very busy teaching them how to carve the frame and there were always three or four students waiting for his advice (Figure 4. 4). He told me he needed an assistant for craft lessons that involve teaching particular techniques. I saw the students looking at the samples they made in the early stages of the project and trying to remember the techniques. They liked learning from the teacher directly best of all and understood the techniques quickly and easily this way. I saw several students looking at a handout and a supplementary textbook also to check carving techniques. The shy and silent students in particular used handouts or supplementary textbooks and managed to solve technical problems without the teacher’s assistance. Although they had practised five techniques at the beginning of the project, they could not apply them effectively. I observed a few students trying to apply the techniques they had learned but their skills were poor.

At the end of project, the students had to complete *kanso* (write explanations of their work, intentions and *kufu*, inventions). Compared with the comments of students I observed in England, they were uncritical and subjective. The teacher told me he would

use the four assessment criteria recommended by the government to assess student work. He used a notebook to record student progress during lessons, and collected in the worksheets, student notebook, and final pieces of work. Unfortunately, he provided little information about assessment.

Figure 4. 3 Exemplary work

Figure 4. 4 Teacher demonstration

4. 3. 2. 2 A craft project in Art & Handicraft

At primary school J2, I observed a project of wood print in Art & Handicraft for Year 5 (students aged ten - eleven). Participants were the teacher (JB) and thirty students (fifteen girls and fifteen boys). The title was *Fujin* & *Raijin* (Gods of wind and thunder). The project lasted ten hours and was timetabled over a period of five weeks. I observed two lessons in February (08/02/07, 20/02/07). According to the teacher, the main aims were ‘to understand Japanese culture‘ ‘to create their own images of *Fujin* & *Raijin* in black and white’, and ‘draw things with carving tools’ (自分の風神又は雷神を創造する、白黒で表現する、刀で描く- 刀の勢い).

I did not observe the introduction to this project. The teacher told me he had discussed ‘*Fujin* & *Raijin’* and how they were represented in the past. He showed pictures of wooden sculptures and a painting by Sotatsu Tawaraya. Then, he asked the students to

produce their own '*Fujin& Raijin*' as woodprints. The sequence of learning activities was to: (i) draw *Fujin* or *Raijin* on paper to generate ideas; (ii) use a Japanese painting brush and *sumi* (Japanese ink) to draw *Fujin* or *Raijin* directly onto a wooden block; (iii) to carve the block and (iv) to print the design with black ink. In my view, this making process was flexible because the students carved their work again after they had printed it. The teacher informed me that he had demonstrated how to use carving tools safely first, then students practiced on wooden blocks purchased from a commercial supplier. The students were expected to prepare *sankakuto* and big and small *maruto* (carving tools) by themselves.

At the beginning of the lesson I observed, the teacher said,

> I am not going to tell you how to do it. Also, you do not need to follow the first draft or sketch. You should use trial and error to solve problems.
> こうやるべきだというのは、教えません。墨のとおり彫ってもおもしろくない、やりながら検討してゆけ。(08/02/07)

Then, he posed some questions and provided the answers. For example, 'Where do we place the eyes and mouth?' afterwards he looked at the student work individually and provided advice. For example, he suggested standing back and looking at the work from a distance so as to be able to decide what to do and applauded a number of students. However, he did not allow them to talk to each other because he wanted them to concentrate on their own work. So, there was total silence in the classroom (Figure 4. 5). He frequently interjected with the remarks 'Think and decide for yourself' and 'Take your work seriously' and pointed out safe ways of carving repeatedly until the students' techniques improved. In addition, he placed some exemplary woodprints by former students on a desk and I noticed some students went over to investigate (Figure 4. 6).

Since some students had nearly finished carving, he gathered them all round another desk and demonstrated the printing process step-by-step. He interacted by asking questions about the tools and how to use them.

Some students appeared rather bored, whereas others took their work very seriously and did not talk much. On refection young children might find carving wood dull because it requires patient and careful work. They only questioned the teacher occasionally and when he praised them, they smiled and appeared satisfied. I got the impression they took his comments very seriously.

After this lesson, the teacher told the students did not work hard enough to achieve beautiful or skilful outcomes. He seemed to expect them to work harder and accomplish better quality work. He explained that it would be difficult for them to develop original ideas because this would mean they would have to follow specific instructions (08/02/07).

According to this teacher, the assessment criteria for Art & Handicraft at this school were based on the ones suggested by MEXT. When he assessed students' work, he looked at both process and product. He told me 'I rely on my *kan* (intuition), when I assess my students' work'. He used a notebook during lessons for recording his evaluative comments.

Figure. 4. 5 Carving a wooden board

Figure. 4. 6 Student woodprint

4. 3. 3 Types of crafts

The main types of crafts they had taught or were teaching were wood, clay, paper and metal craft (e. g. carpentry, wood prints, reliefs, pottery). The craft materials teachers had used or were teaching with were wood, metal, clay, paper, plastic, glass, stone, fabric and wool as well as others such as recycling materials.

Utilitarian objects such as pot stands or pen cases were being produced in secondary schools (Figure 4. 7). In the primary schools, students were making aesthetic objects for expressive reasons, for example, imaginary birds or houses and woodprints of Japanese gods (Figure 4. 8).

The crafts and materials in Japan were more diverse than in England. *Urushi* is used in *tsuishu, raden* and *makie* techniques. The secondary schools I visited in Japan taught *urushi-kogei* (Japanese lacquer craft) and used the oyster shell and gold leaf that are crucial for making several traditional crafts. *Tsuishu* is a kind of Japanese lacquer work

imported from China with a production process that consists of layering lacquer on wood then carving into it.

I discovered commercial kits were frequently used in secondary schools. One kind of kit consisted of raw materials and tools for making and others included ready made parts. All the primary school teachers said they did not like to use kits because they were too restrictive and did not allow freedom in making. The teacher (JB) said the kits were problematic because they were incompatible with developing creative ideas (06/03/07).

Most of the tools and equipment I saw in primary and secondary schools were for working with wood. Carpentry tools and equipment were very much in evidence. Most schools had kilns but some teachers sent student work to material suppliers to fire because the process took too long. In contrast to England, I did not see any computers being used.

I asked teachers what techniques were or had been taught. In addition, I observed teaching several techniques in the schools. Techniques used for wood and clay were commonly identified in primary and secondary schools. Basic carpentry techniques for wood work (cutting wood with electric/hand saw) were observed in both subjects. In particular, teaching different carving techniques for wood prints in primary schools and relief (*katagiribori, yagenbori*) at secondary schools were frequently observed. *Urushi* techniques, for example, *tsuishu* or *raden*, were taught at secondary level and they were used together with carving and other techniques. For example, *kamakurabori* was made using a combination of carving and *urushi* techniques. I did not witness particular techniques being taught for clay work. No named techniques were in use for stone work

but students were carving with chisels. One difference between the two school levels was that the primary school teachers used a greater variety of materials and the secondary school teachers used more authentic traditional craft materials and techniques.

Figure 4. 7 Pen cases

Figure 4. 8 Jungle house

4. 3. 4. School displays

I frequently saw students working in groups to make commemorative plaques in both school levels (Figure 4. 9), particularly carved ones made of wood and metal. An example of this was a group woodcarving made by 3rd year students in a corridor of secondary school J10. I saw wood and metal group work by 3rd year students in secondary school J8. All the secondary schools had glass show cases in the corridors to display student work. There were fewer displays in the secondary schools in Japan than in England. It might be encouraging if more works were displayed there so as to provide students with ideas for their work. In primary schools, I saw displays of paintings or prints and 3 dimensional works, or instance, student self-portraits exhibited in a

corridor at primary school J2. Some schools had a special space for art exhibitions and displays. The exhibition space in primary school J1 contained Year 6 commemorative plaques, carved wooden music boxes.

All the secondary and primary schools I studied displayed work inside art rooms, including students' work and representations of artists' work, exhibition posters, instruction diagrams and other objects. Very few craft examples were displayed in the secondary school classrooms. When I visited two art rooms in secondary school J8, there was no evidence that students looked at artefacts by professional craftspeople but there were some students' woodcrafts. At secondary school J9, three different kinds of crafts made by students were displayed: Japanese paper lampshades, leather craft and wood carving. In primary school J2, I saw more woodcraft than anywhere else including chairs made by Year 5 students. As was the case in the other schools, there were posters with instructions for how to use equipment such as electric saws and how to make woodprints. When I conversed with students in Y5, they informed me that they liked the room as it contained so many interesting and attractive paintings and artefacts (20/02/07).

Figure 4. 9 Group wood carving in secondary school

4. 3. 5 Content, activities and teaching and learning strategies for skilled knowledge

4. 3. 5. 1 Demonstration, observation and practice

I observed teachers demonstrating how to use tools and make objects to the whole class, groups and individuals in all the primary and secondary schools I visited. The teachers repeated the same demonstration to individuals in a woodcarving project at secondary school J10 (21/12/06). I saw each student making one part of a big relief divided into forty pieces. Although they had practised carving techniques before, they had to adapt them to create each piece. So, the teacher had to support individuals not only in how to apply tools safely and correctly but also how to use the techniques. During the observation, I was asked to teach individual students how to use carving tools safely and better. Their level of skilled knowledge and ability to manipulate the tools varied considerably. I questioned if this depended on their learning opportunities outside school. The teacher and I had to teach the same techniques over and over again to individual students. It was time consuming and the teacher needed more skilled

staff. All the Japanese teachers demonstrated how to use tools and make objects.

I often witnessed students practising techniques in the schools I researched. Time to practise was built into projects. For example, in a group project at secondary school J10, Year 3 students designed and carved a small wooden relief (5cm x 5cm) before they started to make the larger real relief (21/12/06). The teacher (JH) told me he wanted them to get used to carving through making the smaller one.

Students in the primary schools practised techniques like carving while making craft objects. The teacher (JA) at primary school J1 told me he tried to develop students' basic making techniques (e.g. how to use a saw) while they were making what they wanted (06/02/07).

I did not see any common techniques being taught to Year 6 students in a project named 'making something from a piece of wood (一枚の板から)' at primary school J2. The teacher (JB) in this school stated that they had already learned how to use basic carpentry tools (08/02/07) but they practised the techniques and tried to hone them until they were satisfied with their work. I found their desire to learn impressive but the teachers expected them to work even harder. One boy did not cut out wheels for his wooden car very well. The teacher criticised their poor quality and showed him some readymade ones, commenting 'you can buy nicer wooden wheels from shops' (こんなのも売っているぞ) (27/02/07). Because this boy did not have enough skilled knowledge to manipulate wood or an electric saw he became frustrated. I suggested that he calm down and draw a good circle with a compass and not stop so often when cutting the

circle out with the electric saw. Until I tried it myself, I did not realise how difficult it is to cut out a small circle. The teacher told me he knew the task was difficult but felt the boy could have done better and he wanted to get him to work harder. In the next lesson, the boy showed me better wheels and according to the teacher, had worked hard to improve his skills (06/03/07). I realised that demonstration and practice alone is not enough. Teachers have to motivate students to improve their skills not just show them techniques.

All the teachers considered it important to teach basic skills and safe use of tools and equipment. I gained the impression that the primary school art teachers were afraid of teaching techniques in isolation and somewhat obsessed with developing students' individual creativity.

4. 3. 5. 2 Exemplary work

Showing good work was the main strategy teachers used to develop both design and skilled knowledge. In lessons about 'making', they used it to explain techniques (for example, by teachers at secondary schools J11, J10 and J8). Once they started making, they realised they needed more skills but until they tried the techniques, they did not know what they lacked. Students looked at exemplary carving whilst making their own at secondary school J11 (26/01/07). Although they had practised carving techniques previously, they lacked awareness of how to use them in their own work.

The Japanese teachers used more exemplary works made by students or themselves than works by professional craftspeople. At secondary school J8, the teacher (JF)

showed work with good carving techniques by former students (07/12/06). I witnessed the teacher (JH) at secondary school J10 making his own work while his students were doing woodcraft (22/01/06). Japanese teachers used exemplary work created by teachers to develop design thinking more than in England. They appeared reticent to teach design thinking but not making.

4. 3. 5. 3 Teacher handouts

In all the secondary schools I studied, handouts were used to teach technical processes. The secondary school art teachers copied information from teacher guidebooks by textbook publishers in addition to writing down and drawing instructions themselves. Their handouts included explanations about materials, tools, and equipment together with and step by step instructions on how to use them. I observed students checking them during lessons and assumed they found them useful both for understanding key steps and whole procedures in order to understand the reasons for the work. Some handouts included instructions for how to care for tools and equipment, which were not evident in any English schools.

4. 3. 5. 4 Supplementary textbooks

A few students in the secondary schools I visited used supplementary textbooks to help them understand craft techniques. They were only available in secondary schools and contained a plethora of detailed information bout materials and tools and technical instructions. The students used supplementary textbooks to refine techniques already learned from teacher lectures and demonstrations. During one craft lesson at secondary school J11, one student commented ‘it is difficult to understand how to carve only from a

book but it helped me remember it' (本だけだとわかりにくい。思い出す時とかに使う。) (16/02/08, Year 1, female). I did not witness any primary school students using textbooks even though they included instructions on, for example how to cut wood.

4. 3. 5. 5 Teachers' views

A recurring answer to my question about the effective ways of developing skilled knowledge was 'demonstration'. Others were practising skills (getting used to doing-repetition) and teaching techniques to enable students to generate and realize ideas.

Demonstrations by teachers

All the teachers agreed on the importance of demonstrations for developing skilled knowledge. They used them in particular to teach new or difficult techniques.

> I demonstrate difficult techniques.
> 技術とか難しいものはやって見せるよ。(JB)

> When I show them how to do something, students are eager to do it at once, for example, cutting wooden boards.
> この道具を使うとこうなるよと見せると、やりたがる。何枚か板を重ねて一度にデンノコで切ってみせたり。(JC)

> Demonstration a good practice and bad practice.
> やってみせて、わざと失敗してみせたり。(JD)

> Showing how to do. Answering questions.
> やっぱり見せること。疑問点に答えてあげること。(JD)

Practising techniques

Four primary and secondary teachers mentioned 'letting them go', together with demonstrations. They told me it was difficult for students to learn techniques unless they attempted them themselves and that they understood them better when they learned

through failure, so-called ‘learning from failing’. When they failed, they realised something was wrong and needed to be resolved in order to succeed. However two secondary school teachers said that they had to support students carefully to ensure they did not fail to complete work (JI, JG). One primary school teacher told me he needed to try to keep as much time as possible for this activity (JD).

> To get used to doing it. Doing by themselves. But they use tools in dangerous ways because they do not think anything will happen to them. So when they do something wrong, I teach them the right way.
> なれる事。怪我をしながら自分で実際にやってみる。でも、自分のこととして考えないから何度注意しても危ない使い方をする。だから、怪我をしたり、危なそうなことをやった時点でもう一度繰り返す。(JC)

> Children are happy when they can cut things. For this kind of lesson, I keep time as much as possible.
> 子供はね、切れたというだけで嬉しい。こういう授業は時間をたっぷり取ってやる。(JD)

> Let them go. A student may fail doing this. Showing exemplary work and how to do it. I do not want them to fail. When they fail I support them and their work so that they do not lose motivation.
> やらせてみる。やってみて失敗することしかないけれどね。見本を見せてやってみせる。失敗しちゃあ困るけれど、失敗してもいやにならないようなホローをこっちがしてあげる。 (JI)

> I demonstrate how to make something in front of them. Although I do not like to touch their work, I sometimes do if it is necessary. I let them repeat and practise techniques. I include ‘repetition’ into a project and let them find out how to do something rather than teach everything at the beginning. I think when they fail they understand the necessary appropriate skills. But I support them so that they do not fail. I think they should acquire skills by trial and error.
> 目の前でやってみせるって当然やります。あんまりやりたくないけど、生徒の作品に手を入れてやって見せる。繰り返しやらせる。反復を仕掛けとしていれる。初めから全部は教えないでなるべく本人が発見して行けるような仕掛けをする。失敗して，ある技術が必要だなって知るように。でも、大失敗しないようにサポートする。いろいろやって最終的に習得できればいいと思う。(JG)

Developing techniques and ideas together

Two teachers said that creative design thinking and skilled knowledge should be developed together (JB, JH).

> Teaching techniques alone is boring, so I teach them together with *hyogen* (self-expression or making).
> 技術だけだとつまらないから、技術は技術で独立しないで、表現と関連付けて教える。(JB)

> Techniques and materials sometimes stimulate self-expression and interests.
> 技と素材が表現や興味を刺激する場合もある。(JH)

Others

One primary school teacher also used textbooks and posters to help students' understand making skills (JC). One primary school teacher mentioned peer teaching (JA).

> If I only use demonstration to teach skills, students forget easily. So, I explain using textbooks and posters as well as demonstration.
> 見せるだけだと忘れてしまうから、教科書やポスターで説明する。(JC)

> I use various approaches to suit students' expressions and students look at their peers' work very carefully.
> 子供の表現形態にあうように。いろんなプローチ。子供は友達のやっているところを本当に良く見ている。(JA)

One secondary school teacher told me it was impossible for students to acquire making techniques within the time allocated for art lessons in schools (JI).

> I think making objects has not been taught very much in schools. More painting is taught in art lessons. It is difficult for students to acquire making techniques in schools because they are not provided with enough time for making.
> 昔からものづくりはそんなにやってきていないと思う、学校では。美術でも絵のほうが断然多いと思うし。やっぱり中学校の授業時間数内で技術をつけるのは無理。 (JI)

4. 3. 6 Content, activities and teaching and learning strategies for design thinking

4. 3. 6. 1 Design processes and stages

The processes being used to develop students' ideas identified in Japan differed from those in England. The individual research and self-evaluation by students I observed in England were not evident in Japan. The common design processes and stages I observed were: (i) introducing a theme; (ii) providing background information in lectures (including art appreciation); (iii) drawing design plans, (iv) making artefacts and (v) writing *knaso*, which means describing ones' own work and that of others. Any necessary techniques were taught at the beginning of a project and students practised them before they started making objects. Compared with the secondary schools, the design process in the primary schools was more flexible. I saw the working processes of a project listed in a handout in a secondary school and noted that the primary school teachers gave more choice to their students, for example, about how to plan a design on paper in advance or through out making.

4. 3. 6. 2 Project titles

A theme or a sort of design brief as a starting point for projects was used in England. Therefore, I looked for the same things in Japan. Although I did not witness the same things as in England, the craft projects I observed had a project title and outlines. In the primary schools, project titles consisted of a few words or one phrase and were frequently imaginative and exciting. They were sometimes in a foreign language, for example, 'Carpenters' or 'Challenging Tinguely' (Jean Tinguely, Swiss artist) in primary school J2. If I were a student, those would be a good stimulus to help me generate and

develop ideas for my own work. Project titles I identified in schools and teachers' lesson plans were:

A angel in a labyrinth (迷宮に迷い込んだ天使) (Year 5, paper craft)
A wire object(ワイヤーオブジェ) (Year 5, metal craft)
An instant mono print (インスタントモノプリント) (Year 6, print)
Carpenters (カーペンターズ) (Year 5, carpentry)
My chair (マイチェアー) (Year 5, carpentry)
Architect's dream (建築家の夢) (Year 5, carpentry)

In the secondary schools, a project title and short description of the project were given to students at the beginning. The craft projects had titles related to functions, materials and techniques.

Seal engraving (篆刻) (Year 2, stone craft)
Tuishu (堆朱) (Year 2, Japanese lacquer craft)
Paper weight (ペーパーウエイト) (Year 3, glass craft)
Wooden clock (木彫時計) (Year 2, carpentry)

An example of a brief description of project was;

> Wooden clock: People have made things since they first appeared in this world. We are surrounded by many kinds of tools and general merchandise now. Some are for everyday life. There are handicraft goods that succeed examples of traditional craftsmanship from old times. Let's make a clock out of an acrylic sheet and use wood carving techniques while aiming to achieve harmony of the function and beauty.
>
> 木彫時計: 人とものづくりのかかわりには、この世に人類が誕生したときから始まりました。現在、私たちの身の回りには、あらゆる道具や生活用品が満ちあふれています。多くは生活用品ですが、なかには昔からの伝統技術を受け継いだ手工芸品もあります。今回は木材とアクリル板を使って、木彫の技法を生かし、機能と美の調和を目指して温もりのある時計を作りましょう。

4. 3. 6. 3 Teacher instructions

At the beginning of each project, the teachers gave a particular kind of instructions

about the projects in lecture style. Unfortunately, I only observed this happening in one project at primary school J1 (23/02/07). In this project, students were expected to make a story with four scenes out of paper and any material they had used previously. Teacher JA showed some cartoons to students to help them develop their own stories. Other teachers told me about the lectures they gave to students at the beginning of the projects I observed. For example, in the *kamakurabori* project at secondary school J12, the teacher (JJ) gave an art history lecture and showed examples (02/11/06). Although I did not see any individual research in the Japanese schools, the lectures must have helped students to generate and develop ideas.

4. 3. 6. 4 Exemplary work

I observed that the teachers showed a lot of exemplary work made by students and some artists. For example, work by Karel Appel (1921-2006), a Dutch artist being introduced in a woodwork project at primary school J1, called 'A heart man' for Year 6. Also, the American artist Alexander Calder (1898-1976) work was introduced in a project called 'Wire object' (Year 5, metal). In the secondary schools, former student work was used frequently but not many craftspeople work. Most craft projects in secondary schools featured crafts made by anonymous Japanese craftsmen, for example, *kamakurabori* (wood carving). Perhaps, this is because Japanese art education tends to emphasise character development rather than professional training to become a craftsperson.

4. 3. 6. 5 Student worksheets

The handouts I saw in the secondary schools contained the information about the

historical context of the craftwork and instructions for how to make something, specifying techniques and materials. The student worksheets I saw in the secondary schools contained a project title, tasks and a space for drawing a final idea. This was used in all the secondary schools I visited by students to plan a final design idea before they started making. However, there was no space on it for brainstorming or mind mapping for developing ideas. I questioned whether this really helped students develop their own ideas. I observed that the students drew and erased their ideas again and again in all the schools and their handouts become crumpled. At secondary school J13, I observed a lesson on the topic 'Memory of school trip' (08/03/07). The students were asked to design the surface of a wooden kaleidoscope based on Japanese traditional design they had seen on the trip and to carve it. The teacher (JK) gave a handout (Figure 4. 10) consisting of the following:

(1) (title of project) making a kaleidoscope (万華鏡づくり)
(2) (theme) memory of school trip (修学旅行の思いで)
(3) (description of task) In a school trip, we looked at a statue of Buddha in Nara, *sanjusangendo*, and many temples and learned through these experiences. Let's design decorations for a kaleidoscope using the resources (e.g. photos or leaflets) you like best (修学旅行では奈良の大仏、金閣寺、三十三間堂、さまざまなお寺や仏像体験学習などを見聞してきました。その中で一番思い出に残っているものを資料（写真、パンフレット等）を使いながら、万華鏡の胴体の部分のデザインを考えてみましょう。)
(4) my theme (私のテーマ) (students are expected to identify their own theme)
(5) space for a final drawing of the idea.

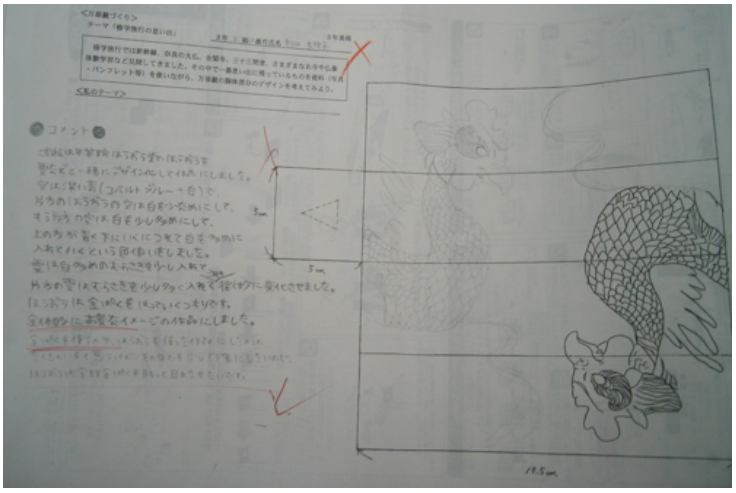


Figure 4. 10 Student worksheet

In contrast to England, there was less writing on them in Japan. Furthermore, I could not understand the design and making processes they recorded.

4. 3. 6. 6 Sketchbooks and notebooks

As the use of sketchbooks was recommended as a tool to develop creativity in English policy and practice, I looked for them in schools in Japan. Sketchbooks and notebooks were used in Japanese schools but there was no significant difference in the way of utilizing them. In the primary schools I visited, they were used simply for sketching real life objects or drawing design ideas and sometimes for writing *kanso*. The ones used in the secondary schools included notes on lectures or teacher instructions, drawings of ideas and *kanso*. In addition, students glued handouts about techniques, explanations or backgrounds of artwork into them. I could only see their final ideas in the sketchbooks or notebooks. They all had similar content.

4. 3. 6. 7 *Kanso*

It appeared students were always expected to complete *kanso* or write about what they

had learned from a project, at the end as a way of the identifying strengths and weakness of their own work and possible further developments. They also wrote about what they thought about other students' work and had learned from it. Secondary school J8, the students were expected to record the following information in their notebooks after every lesson: (i) date of lesson; (ii) name of project; (iii) lesson aims (given by the teacher); (iv) learning outcomes (given by a teacher) and (v) *kanso* (what they felt or thought about own work).The teacher (JF) at secondary school J8 checked every notebook after the lesson finished and wrote very short comments in each one. At this school, it was clear they were used to assess student attitudes and effort but this was not always the case in other schools. As far as I could tell, the students' comments on their work were rather simplistic. An example was 'it took a long time to make the colours and I could not paint the work nicely' (色を作るのにけっこう時間がかかってしまったし、なかなかていねいにぬれなかった。) (Year1, female student) (26/01/07). They were less critical than one I saw in England.

4. 3. 6. 8 One to one teaching

The Japanese teachers used one to one teaching frequently. They only taught the whole class at the beginnings and ends of lessons. They walked around students' tables and monitored student progress, providing suggestions and discussing the work with them individually.

4. 3. 6. 9 Learning from peers

The students looked at their peers' work when they did not know what to do. Primary school teacher JA told me they look at each other's work very carefully (06/02/07).

When I observed his lessons, students often got up and walked around to look at other students' work and then returned to their own (19/02/07). This was the case in other schools. They did not make negative comments and seemed to find it helpful.

4. 3. 6. 10 Books

In some schools, books were used extensively to generate and develop ideas in the craft projects I observed. For example, at secondary school E10, some students borrowed books from their school libraries and others used ones stored in art rooms for a carving project (21/12/06). The books I looked at in the art rooms included: illustrations of animals, insects, plants as well as collections of artwork. However, they had been published more than twenty years ago.

4. 3. 6. 11 Art teachers' views

I asked the teachers 'In your experience, what teaching methods are most effective for helping your students to generate and develop their own ideas in skilled making?' The most common answer was 'art appreciation'. Others were curriculum planning, discussion, individual research and encouraging processes.

Art appreciation

Many teachers referred to the importance of art appreciation. One strategy they mentioned for developing this was showing reproductions of exemplary work by craftspeople and peers.

> I showed artworks from other classes as example so students get a variety of ideas.
> 一つのクラス内で作品が同じようになるので、他のクラスの作品を見せる。(JC)

Art appreciation in everyday life is important, for example, exhibitions. It is important for students to look at artworks that interest them in everyday life. So, I try to create that kind of school environment.
日常的な鑑賞の大切さみたいなもの。展覧会とか。やはり、興味を持って日常的に見ていることって大事。だから、そういう環境を作る。(JB)

The teachers told me showing exemplary work motivated students and helps them develop ideas.

Resources and materials can be stimuli.
資料や材料が刺激になる。(JH)

I teach art appreciation before making. First, I try to make students interested in a topic so that they think they want to make it.
鑑賞を制作に入る前にやっていますね。初めはおもしろいなって感じさせる。子どもたちが早く自分のものを作りたいって思えるように。(JG)

I think it is observing student artwork made in the past. I explain how other students generated and developed ideas from a given theme using their exemplary work.
過去の作品を観察するってこととかね。テーマからどういう方向に持っていくかという参考を見せる。(JI)

Successful projects depend on how I introduce themes to students. For instance, to show photos of professional crafts people's work to them even though they are lower secondary students.
どういう、テーマの提示の仕方が取り組みを成功させるかにかかってくると思います。例えば、中学生だけれどもプロの作品を見せたりだとか、写真とかね。(JD)

Curriculum planning

The teachers referred to the need to balance focused and open project themes and introduce familiar topics that interest students. Interestingly, many teachers thought that closed themes helped students develop ideas.

Do not give them too much freedom, we need some degree of restriction.
自由にしすぎない、ある程度の制限は必要。(JC)

It is important for teachers to give clear problems to children. Projects with limited themes produced by the teacher and projects where students decide the theme by themselves … both types are important.
子供から見て問題点をはっきりさせることが大切。ある程度課題内容を制限したもので課題をはっきりさせたものと、自分で問題設定した自分でテーマを見つけるような、、、両方大事。(JH)

There is a point children are interested in. I want to use it for a project.
子供特有に興味を持つポイントってあると思うよね。それを授業にしてゆきたいな。(JD)

Group work

Three teachers mentioned that group work is important. One teacher mentioned that a workshop type environment was good for group work because looking at each others' work and discussing ideas with them provide stimulation (JB). Two secondary school teachers referred to the importance of group discussion (JF, JG).

There is a strategy that students generate ideas in discussion with peers. Sharing different opinions from own.
子供たちが自分たちで話し合って発想していくという手もありますね。友達と違う意見を出し合ったり。(JF).

I ask students to discuss their ideas in a group. They work very well in this way rather than discussing them with the whole class.
どんなアイディアが出たかっていうのはみんなで話し合って意見交換しますね。(クラス全体よりも）グループにしたらどんどん話が発展していったので。(JG)

Individual research

Two teachers stressed the importance of individual research for generating ideas though they complained about the lack of time for this (JC, JI).

You cannot generate and develop ideas without information, so I ask students to do research using books and Internet.
何にもないところからは考えられないから、本、ネットとか使って調べてもらう。(JC)

If there was enough time, student research would be good. I ask upper

secondary school students to do some. In the case of lower secondary school students, I motivate them by showing exemplary work and hope they get some inspiration from it.

時間があれば、リサーチとか。高校生だとリサーチはさせます。中学生の場合、参考例を見せながら動機づけをしていきながら、そこからのインスピレーションを得てくれればなって。(JI)

Encouraging processes

One primary school art teacher pointed out that ideas can be developed though making (JB).

I do not think students have to have an idea from the beginning of a project. I suggest students 'think with their hands'. They may generate and develop ideas through making objects. Too much pressure to generate a final idea at the beginning makes students dislike craft … a teacher works with children through making processes and generating ideas. They should try ideas by themselves, see the results and then understand them. These processes are important.

発想というのは初めから豊かでなくてもよいと思う。それはね、手で考えるっていうことを奨励している。アイディアはやってから出てきてもいいじゃないの。そういうことがものづくり嫌いを生んでいると思う。ものづくりの過程プラス、アイディアの出し方も子どもと共有してゆくみたいな。自分でやって、自分で見ていくとね、納得するし。こいうプロセスが大事。(JB)

4. 3. 7 Assessment

All the schools I visited used the assessment criteria identified in documents about *Shidoyoroku* (MEXT, 2001). The methods of assessment were teacher observation of student activities and work in progress and grading end products and students' written *kanso* on their own and each others' work. In the primary schools, three teachers used photographs to record student work in a process. They claimed this was an effective method of recording what they actually did (JA, JB, JD). The secondary schools I visited conducted paper and pencil tests at the end and middle of each semester designed by the teachers. They

assessed student knowledge and understanding of materials and tools, making procedures, and their knowledge of art, including art history.

4. 3. 8 Resources

4. 3. 8. 1 Accommodation and facilities

The primary and secondary schools I visited had one or two specialist art rooms each. They used one room for lessons and another for storage. For example, primary school J2 had a room for lessons and what one the teacher and students called a ‘treasure room’ for storing materials and student work. At J8 secondary school, one room was used for lessons and the other for storing student work. Unlike the English schools, the Japanese ones did not have specialist rooms for textiles and ceramics or facilities such as darkrooms. However, both primary and secondary schools had electric and gas kilns for pottery and cloisonné. Facilities in all schools were similar. All the art rooms had sinks, a blackboard and wooden worktables. Most teachers pushed the desks together for group work.

4. 3. 8. 2 Materials, tools and equipment

Typically, all the schools I researched provided materials and tools for students. For instance, in a project at primary school J3, the teacher (JC) provided all the Year 5 students with some clay, a wooden board, wire and glazes. Furthermore, in a stone carving project at secondary school J8, the teacher (JF) provided the stone and carving tools. Occasionally students were requested to bring in their own materials or tools. For example, at primary school J3, all the Year 6 students were asked to bring in their own carving tools to make a wooden musical box and at primary school J1, Year 5 students

had to bring in cloth, paper and wire for a handicraft project. Teacher JC said, ‘I do this so that they learn to take care of tools well’ (03/02/07).

As noted previously, commercial kits were being used in Japanese secondary schools more often than in primary schools. At secondary school J13, students used kits for *tuishu* that included a technical instruction sheet.

The Japanese primary schools I visited had well-equipped art workshops. Primary school J1 had electric saws, an electric polystyrene cutter, electric grinder, electric drill and printing press. The secondary schools were poorly equipped in contrast and the art room at secondary school J8 only had four electric saws and one printing press.

4. 3. 8. 3 Types of teaching resources

All the teachers in the schools located in Tokyo visited art exhibitions at other schools to get ideas for lessons. They informed me that each primary school has an art exhibition every three years to show student work to families, local people and other teachers. I visited four exhibitions at primary schools J6 and J7 and saw that many art teachers attended and talked enthusiastically about the art projects and student work being exhibited. The secondary teachers stated that they acquired ideas from seminars and conferences organised by the Board of Education or teacher organizations and did not use the teacher guidebooks published by textbook companies, which surprised me. I did not see any projects using external resources such as museums and galleries, or artists in residences, unlike in English schools.

Most of the teachers I interviewed were interested in working with artists in residence and taking their students to museums and galleries to view art. Two primary school teachers I interviewed told me they took students on visits to local art galleries and the National Art Museum with their students (JA, JD). However, they were concerned about the used of artists (JB, JH).

> I could not invite artists to my lessons. If I did so, I would have to have a very good reason.
> アーティストを招くことは出来ない。やっぱり、こっちのベースをしっかり作って、どうしてどこに必要か明確にしなければならない。(JB)

> I think it is difficult for people who are not trained to teach in schools to teach here.
> 学校で指導することを訓練していない人が教えるのは難しいと思う。(JH)

4. 3. 8 Teachers' views of craft education

During and after my observations of craft lessons, I conducted semi-structured interviews with four primary and four secondary school art teachers (JA, JB, JC, JD, JF, JG, JH, JI).

4. 3. 8. 1 Concepts of *kogei and kosaku*

The policy documents defined *kogei* as making functional, useful and traditional objects and *kosaku* as making that develops knowledge of materials and tools. The primary and secondary school teachers commonly understood *kogei* as referring to lessons in which students followed prescribed specific processes and learned how to use tools and materials and specific techniques. The secondary school teachers told me that in *kogei* students follow specific instructions, develop manual dexterity and learn how to make things for everyday life. They differed from fine art lessons which were freer and

emphasised original ideas.

> I understand *kokgei* as functional and involving making things using traditional techniques.
> 工芸っていうと機能性があって伝統的な技術を使って作り上げる気がする。(JF)

> *Kogei* is related to tradition. It links to local culture and making things in everyday life.
> 工芸というと、伝統的なモノとのかかわり。地域と密着した、生活とともに作られたもの。(JD)

> I think *kogei* activity is dominated by culture or traditional techniques and involves skilled knowledge.
> 文化とかあるいはその伝承的な技能とか管理された活動っていう気がします (JA)

> *Kogei* in schools means 'things that can be used in everyday life' and making things to be used. *Kogei* is about how we can make useful, functional things. But both kogei and kosaku are about making something we can use.
> 学校の中での工芸は'身近につかえるもの'、使うものを作るぞっていうのがなんだろうな。中学校だと遊びだけでは終わらない、どうやって使いやすいものを作るか、用途のあるものを作るのが工芸って気がしますね。でも、共通してやっぱり使えるものを作るって言うことかな。(JI)

> *Kogei* is about *gei* (the arts). So, it should involve *isho* (design) and also technique.
> 工芸っていうと芸ですからそこには意匠とかデザイン性もあれば、技術も伴ってこなければ工芸とはいえないのではないか。(JD)

However, two teachers told me that *kogei* does not always involve making functional or useful objects (JG, JH).

> Although I have taught this way, I do not think function is all there is to kogei.
> 機能性のある工芸も教えています。だけど、それが工芸のすべてだとは考えてはいないです。(JG)

> There is no border between *kogei* and *kosaku*. Kogei is a little bit more traditional and functional. It is an individual thing, purposeful for our lives and more technical. Traditional crafts are easily recognized. But contemporary crafts are no different

from fine arts because they use various kinds of materials together.
境はないと思う。多少伝統的であるとか機能性とかいろいろあるけれど。工芸は個人的なもので、生活の目的のあるもの、もっと技術よりというか。伝統工芸なんかはわかりやすいだろうけれど、現代工芸なんか複合素材でファインアートなんかとの違いなんてないよ。(JH)

One teacher claimed that their students were too scared to develop original ideas, and this explained why *kogei* was a popular activity (JH).

The primary teachers held negative views about teaching *kogei* because it meant students had to follow the same making procedures and use the same materials.

Kogei and *Kosaku* are different. Kogei emphasizes utilitarian and traditional techniques. My impression is that more kogei is taught in secondary schools. Also, there is confusion between Technology & Home Economics and Art.
工芸と工作は違うね。工芸って言うと実用性重視みたいな感じがするし、伝統的な技術を連想するよね。中学校の美術には工芸的なものが多いなって気がするね。あとは、中学校でやっている美術と技術家庭の混沌のようなもの。(JB)

These teachers understood *kosaku* as offering more freedom to students to explore materials and tools and develop ideas. Some secondary school teachers suggested *kosaku* was essentially a form of '*asobi*' (play). One of them told me that *kogei* was really '*gei*' (art) so it required better technical and '*isho*' (design skills) than *kosaku* (JH).

I think *kosaku* is about making things. I think drawing is *kosaku*.
工作、ものづくりですね。絵を描くことも含めてものづくりに入ると思う。(JA)

Kosaku emphasizes individuality.
（工作は）関わりあう個人がクローズアップされてくるような感じがする。(JD)

Kosaku has an element of play (*asobi*). Before they make things, students play and enjoy *kosaku*. In secondary schools, it is not only about play (it is also serious work).
工作ってもっと遊びの要素が入って来ると思うんですよ。ものを作る以前に工作して遊べるってたのしむって。(JH)

Kosaku has an element of play, more so, than kogei and *zokei asobi* (playful art study).
工作っていうとわりと遊びてきな割合が多いのかな、造形遊び的な要素も入ってくるのかな。(JG)

Functional and usefulness seemed to be very important in the secondary schools. *Kogei* seemed to be closer to the term craft than *kosaku.* However, creativity did not seem to be as important as in England.

4. 3. 8. 2 Values on crafts education in schools

In answering my questions 'What do you think the benefits of teaching skilled making in Art? Are they different from other school subjects? ' most teachers, pointed out the practical aspects such as exploring materials and experiencing making. They emphasised that students realise ideas though making things and think with their bodies not just their minds. In contrast to English policy and practice and the specialist literature on craft which emphasised cognitive learning, the Japanese teachers valued development of physical or motor skills, a sense of touch, the enjoyment of making and effort.

Students can develop ideas while they are making things. Imagination alone is not enough. They should try to make something even though it is not always possible for them to realise their ideas in practice. They gain more from this.
作業しながら思いついたことを発展させてゆける。想像だけでは、、、実際に作ってみないと、、、頭の中で描いたものが出来るとは限らないし、苦労して作ったほうがいい。(JC)

The important thing is for students to find out for themselves what they want to make. This is not the case in other school subjects. I think enjoyment, freedom, and realising ideas are important. It is not only generating ideas but also realising ideas (completing an object)…through trial and error in the designing and making processes, they come to understand themselves. I teach crafts so students can engage in decision-making. So, it is not like *kogei*. If there is no opportunity for

children to make decisions by themselves, it is no good for them.
何をつくるかを自分で見つける大事さ。他の教科に無いものね、僕は楽しさと自由と実現だと思うよ。着想だけじゃなくて先後まで形にすること。… その試行錯誤の過程で自分自身と出会う。自己決定ができるものづくりをさせる。だから工芸的なものじゃあないな。そういうのが無かったら子どもにとって有効でない。(JB)

You feel cold when you touch metal. Craft activities tell you many things through your physical senses when you approach materials. I think it important to feel changes and variations.
… 金属触ったら冷たいとか、自分が物にはたらきかけたときの身体感覚も含めてものっていろいろなものを教えてくれますよね。それはものすごく大事なことだと思います。変化を感じるっていうか。(JA)

If you want to make something, you cannot do it without some previous experience.
いざ作りたいっていうときに実際に作る経験がないと出来ないと思うので。(JG)

On the other hand, the secondary school art teachers admitted that art is not about self-expression only and this is why teaching *kogei* is important for Art.

When I think about learning achievements in Art, I know it is important to be able to use tools. This is why, I think craft should be included in the curriculum. Art is not just about painting or self-expression.
美術における学力って何だっていうときに … 道具を使えたり考えたりというのも私は必要だと思う。そういう意味で工芸的なものって入れていかなければならないんだと思う。絵だけでは、表現だけでは美術は無いと思うんですね。(JI)

Another teacher said that;

I understand that art is a central part of life. *Kogei* is important too because it is part of everyday life.
私の美術の考え方は生活とマッチしているということ。だから、工芸的なものって重要になるのかなって思います。(JF).

Interestingly, only the primary school teachers valued skilled making because of its creative problem solving characteristics. The secondary school art teachers valued *kogei* because it emphasises skilled knowledge more than other art forms such as

painting. They both valued *kogei* and *kosaku* because they are about killed knowledge. However, in neither the primary nor secondary school teachers referred to them as cognitive learning.

4. 3. 8. 3 Pleasure of making

In answer to my question, 'Do you think your students enjoy making or learning how to make things in your lessons?' they all replied that they liked it very much.

> Fundamentally, I believe children are human beings who love making things.
> 子どもは本来ものを作ったりするのが大好きな人間だと思いますよ。(JB)

> Children enjoy approaching things with their bodies and changing them. It is not really about making things. It is more about enjoyment.
> 実際に自分が体を使ってモノに働きかけることによって、モノが変化することに、子供は喜びを感じているような感じがする。それは、作るってかんじではないかもしれない。作りっていう前に楽しんだり。(JD)

Two secondary school art teachers referred to the role of repetition in making (JH, JI). They said their students particularly liked repetitive tasks like carving although they struggled with generating ideas.

> Yes, they enjoy it. However, it is very hard for them to generate ideas or decide what they want to make. I think it is important for young students to experience repetition in their work, for example, doing something peaceful such as carving. I think it is also important to combine self-expression, experiencing materials, and making functional and useful things.
> 楽しんでいるようです。しかし、アイディアを出すまで作り出すまでが大変、何を作るか決めるまでが大変だよね。それに、思春期の子供にとって何か一つのことを繰り返すような作業、平和な作業、削ったりする、そういうのは大事だと思う。自己表現、素材体験、用途目的のあるものづくりを適度に合せることが大事だよね。(JH)

> Students like plugging away at making objects though some do not like painting. Of course, there are students who are not good at it, but plug away and enjoy it. In my experience, they enjoy making activities, following specific making

processes.

こつこつやる事は好きだよね。絵だといやだっていう子もいるんだけれど。不得意な子もいるけれど楽しんでコツコツやっていますね。みていると、作る段階のようなものがあってやるものは楽しんでやっていますね。(JI)

4. 3. 8. 4 Developing thinking skills as a contemporary rationale

My preliminary research revealed that craft was initially introduced into general education as a practical subject in both Japan and England in the 19th century and that the development of thinking skills such as problem-solving and creative thinking was a relatively new rationale for craft education. So, I asked the teachers for their views on developing students' cognitive skills in craft education. The common answer was that *kogei/ kosaku* are not just about technique. Interestingly, although I asked about thinking skills, they referred to making together with thinking skills.

Thinking, planning and how to use time. It is more than making, it is also thinking.

考え、構想、時間の使い方。ただ作ってただやるっていうのではない。(JF)

The school subject of Art and Handicraft has always been promoted for ideological reasons by policy makers. It was used to develop manual dexterity in national policy before World War Two. Making things should be creative and connected to making.

図工という教科は利用されてきた教科。戦前の手工のように、国策としての教育、手の巧緻性を養う。図工のものづくりは創造的でないといけないと思うし、表現と結びついていないといけないと思う。(JB)

Through communicating with things, students find out clearly what they want to make. Then, they acquire the necessary techniques individually. This way, techniques have meaning and children embrace them.

ものとのかかわりの中で、どうしたいかっていうことがより鮮明になっていくわけで。それに、個別に必要な技術が付随してくるっていう感じ。その時に、子供たちの中で技術が技術らしく生まれていく。子ども自身のものになっていく。 (JD)

Students need to use more tools to do kogei than painting. Also, they have to

invent ways of making at each step. How can I do this? I am not sure if creativity is necessary or not but…it is important for students to experience something new to them through making. They cannot experience making things in other schools subjects. I do not know what they are going to do in the future. However, I think that basic manual work is important. They do not use so many different tools and materials in painting.

絵を描くのと違って、いろいろな用具を使えないといけない。もう一つは、一つの段階において工夫しないといけない。どういうふうにやったらいいかって。創造性が必要かって言うところは難しいけれど、その一人一人にとっての新しいいろいろなことを物を作っていきながら経験することって大事ですよ。物を作るなんてほかの教科じゃ出来ないわけだから。将来何になるかわからないけれど、手を使って何かする基本的な作業って大事ですよ。絵だけでは出来ないですよ、こんなにいろいろな道具や素材の経験をしながら作るって。(JI)

I understand that it is difficult to make things without using thinking skills.

思考力がないとものづくりは難しい。(JG)

4. 3. 8. 5 Conflicts in craft learning

A British expert on craft (Dormer, 1990) has pointed out that there are rules for following specific techniques and processes in craft and many people assume this necessarily conflicts with freedom of thought, imagination, and expression. I asked the teachers' views on this statement. They all considered it important to teach basic techniques. Two primary school art teachers (JA, JB) told me that they wanted students to learn skilled knowledge through experiences with materials and tools that resembled *asobi* (play).

(Techniques I teach) depend on each child's proficiency … however, scissors are for cutting and knives are for carving and it is important students are able to use such tools safely and effectively. In my lessons in *zokeiasobi* (playful art) I want my students to have a diverse experience of materials and approaches … but there is not enough time to absorb them. So I include some projects about 'making' like the musical boxes I showed you. I respond to students' requests individually rather than ask them, all to do the same things.

子供の習熟度によっても違いますし。…ハサミは切るための道具だし、ナイフは削るため

の道具だし、そういったものを安全に有効に使えるようになることは重要だと思うんですね。僕としてはですよ、造形遊びの中でいろいろな素材や体験をして物に働きかけて、材料と合わせて用具もたくさん使わせます。それだけだと子供の中に定着しない部分があるので、年間の中でものを作る作り上げる部分は入れています。さっきのオルゴール箱のような。子どもがこういうことをしたいとか、そういう要望に応えて、じゃあこういうふうにしてごらんって指導します。全員にこうしてくださいというのではなくて。(JA)

In *kogei*, the maker needs to follow specific processes and techniques. But in *kosaku*, I want to teach students to make things by linking it to *asobi* (play).
(工芸的) 時間的な経過や技術をピシッとやっていかなかったらそうはならないですよね。…でも、そういうことではなくてより工作に、より子どもの遊びせいに戻っていきたいっていうのはありますよ。(JB)

All the teachers thought getting the right balance between discipline and freedom was very important. One primary school art teacher explained how he sets a framework and rules for projects that allowed for freedom (JD). Also, he told me it was important to take children's developmental stage into account in designing meaningful tasks. Some secondary school art teachers admitted there was a dilemma between rules and freedom in *kogei* but suggested the rules stimulate creative ideas. They admitted it was difficult for students in primary and secondary schools to produce original work.

I think rules are important. A teacher has to think about rules for children. I do not think they restrict children's freedom. But there is this dilemma. No art lesson is without a dilemma. It is about how to organize a project.
ルールは絶対必要だというのは僕の考えです。子供にとってどんなルールなのか深く考える必要があると思う。僕は決して自由になれにないとか思わない。すごいジレンマがある。そのジレンマが無い図工の授業はありえないと思う。授業のフレームの設定の仕方じゃないかな。(JD)

I think it would be difficult for students to make things without any restrictions. These restrictions stimulate their making. Less restriction makes things too simple. Making is like a battle of decision-making.
制限が無いほうが難しいと思う。制限に刺激されることで制作できることもある。制約があっさりしすぎると、むしろ深くなく見える。意思決定の戦いだよ。(JH)

It is difficult for lower secondary school students to be original in their work. But I want to help them try to make what they want. In craft, there are restrictions on materials and techniques … through fighting with restrictions people can make something interesting.

中学生の場合、オリジナルって言うのは難しい。けれど、その子がしたいことをそこにいかしてあげる。素材の持っている制約、技術的な制約なんかがあるわけですよね。,,, 制約とぶつかりながらのほうがかえって個性的なものが出来たりして良いかな。(JI)

I do not think a teacher should emphasise originality in the early stages of craft learning… from my experience as an artist, I think we all start from imitating something.

早い段階でオリジナリティーっていうものを押し付けるのはどうかと思う。自分が制作していて、、、初めは何でも模倣から始まるって考えているので、模倣しながら形とか色とかに向き合っていながら自分に向き合ってオリジナリティーが出てくるかなって。(JG)

All the teachers admitted there was a dilemma between freedom and teaching skills in both *kosaku* and *kogei* but tried to solved it differently used different approaches to it. I concluded there was a strong emphasis on *asobi* (play) in the primary schools and more traditional approaches (such as repetition and skills training) to learning crafts in the secondary schools.

4. 3. 8. 6 Professional development

One interview question I asked was 'Do you think that it is important for teachers to develop and acquire specific craft skills themselves?' They all understood that good making skills are crucial and that this takes a long time and that they are best learned from craftspeople because they are embedded in their professional work.

It is important to learn from other people. A skilled person can develop children's techniques and ideas.

人を通じて学ぶっていうところは大事ですね。子供がその人を通じて技術や考えを引き出しからもらうことが出来るというのがあるので。(JA)

There is knowledge that comes from experience of making things such how to use a plane or nails. This is developed over many years.
カンナの使い方にしろ、クギのうち方にしろ、そこには経験的な知恵が隠れていて、それは、長い時間かかって磨かれた知恵だと思うよね。(JD)

It is important for teachers to have experience of using craft skills, they cannot explain this through words alone. However, teachers should try to teach those skills, even though they find it difficult. It is endless. But it is the teacher's job.
これは重要。沢山体験しないと実感のある言葉で語れない。自分自身がやってみて下手でも良いから。はてしないと思うけど。教師だから。(JH)

My background is painting so I do not have any knowledge of crafts. However, when I looked at crafts, I found I wanted to teach them. If I have tools and material, I may be able to teach them. Although it does not look difficult, it may be difficult for me because I do not have the right kind of making experience. If people cannot realize their own ideas, this is not true creativity.
特に私は絵画出身ですので工芸関係の知識は浅いので。ほかの学校の作品を見て陶芸なんかやってみたいなって思います。道具をそろえれば出来るとは思うんです。知識だけ見るとそんなにむずかしいとは思わないけど、経験がないので。,,, イメージだけで良いっていうのは本当の創造的ないアイディアと違うと思う。(JG)

One primary teacher told me that teachers must consider ways of using tools and materials safely, because young makers are smaller and weaker than adults (JB).

Especially for children, we need to be able to teach not only how to use tools but also how to use them safely. There are different ways of teaching adults and children how to use a saw safely. It is very important for teachers to study them.
特にね、子どもに教える場合に使い方ももちろんだけどね、安全的なものね。子どもにとっての、のこぎりの使い方っていうのがあるし。子どもに沿った使い方を研究することはすごく大事。 (JB)

In his lessons, I noticed that he asked students to fix wood at a work table with equipment and a saw using both hands. This was because a small child cannot hold wood and cut it at once. As I had never thought about teaching students how to use

tools, I found this very useful for my teaching. Teachers need experience of making to understand how to teach it to students. Thus it is not just a matter of becoming a skilled maker but also a skilled teacher.

4. 4 Analysis of Home Economics and Technology & Home Economics policy documents

4. 4. 1 Background to document analysis

After I completed the fieldwork, I decided to analyze the policy documents for Home Economics for primary schools and Technology & Home Economics for secondary schools. I studied the Courses of Study for Home Economics and Technology & Home Economics, the textbooks and documents about *Shidoyoroku*. The learning domains in these curricula were based on types of fundamental human need for living. In the Course of Study for Home Economics, the curriculum content was covering family life, food, clothing and shelter (MEXT, 1999c). In Technology & Home Economics, it was divided into 'Technology' and 'Home Economics'. The learning domain 'Technology' included 'Technology and making things' (技術とものづくり) and 'Information and computer' (情報とコンピューター) and one for 'Home Economics' included 'Independent life and food, clothing and sheltering' (生活の自立と衣食住) and 'Family and family life' (家族と家庭生活) (MEXT, 1999d; 8). In this research, I only looked at making clothing in Home Economics and making using wood, metal and plastics in Technology. There were only two authorized textbooks for these subjects at primary and secondary school levels published by Tokyo Shoseki and Kairyudo. In the case of Technology & Home Economics, these were separate textbooks for Technology and Home Economics were separated.

To help me analyse the policy documents for these subjects, I revised the questions I used for Art and Art & Handicrafts in Japan. I could not find the words, *kosaku* and *kogei,* design thinking or skilled knowledge in my preliminary investigation into the documents. So I searched for the implicit references to craft, design thinking and skilled knowledge. The list of questions I asked myself was as follows:

1. How is the concept of craft as skilled making referred to in the documents?
2. How are skilled knowledge and design thinking understood?
3. Which of the aims are relevant to craft education?
4. What types of craft are recommended?
5. Which teaching strategies are recommended that help students manipulate materials and tools and acquire specific craft techniques?
6. What resources are recommended for crafts?
7. Which teaching strategies are recommended to help students generate and develop design ideas?
8. What resources are recommended for design?

4. 4. 2 References to craft, design thinking and skilled knowledge

4. 4. 2. 1 Craft

The term *seisakusuru*, which can be translated as to ‘produce’ or ‘make’ in English was used in the documents. For example, in a section about clothing, it was stated that students should be able to make something useful for everyday life (MEXT, 1999c). The term ‘*monozukuri’,* which can be translated as to making things and mending mechanical or industrial products, was used (MEXT, 1999d). Making and mending useful and functional things to meet needs in domestic life was emphasized. In addition, I found *seisakusuru* and *monozukuri* in all the textbooks I studied. Students were expected to make functional objects such as bookshelves and T-shirts.

4. 4. 2. 2 Design thinking

I did not find the terms, 'design thinking' in the Courses of Study. However, the terms *sekkeisuru* and *keikakusuru*, which referred to generating ideas and planning, were used. It was stated that;

> Students should be able to generate ideas to make an object using fabrics and devise a production plan for it.
> 布を用いて製作する物を考え，製作計画を立てること。
>
> (Course of Study in Home Economics, MEXT, 1999c; 31)

These could be substitutes for the term 'design thinking' because they referred to stages in the design process models I had identified in the literature review (e.g. Fasciato, 2002).

In the textbooks I studied, the term '*dezain*' (design) was used to refer to applied arts or design as decorating surfaces of products but not design thinking. The problem solving stage of the design process was explained in these documents; for example, 'the journey of problem-solving' (問題を解決する道すじ) (Kairyudo, 2007b, c;13). This will be discussed in more detail later in the section about contents, activities and teaching and learning strategies.

4. 4. 2. 3 Skilled knowledge

All the Courses of Study emphasized learning about knowledge of materials, tools and processes and the practical knowledge that is necessary to enable students to process and finish products. I found that learning through doing was central in these subjects. However, skilled knowledge was not fully explained, perhaps because it is a form of tacit knowledge.

The contents of the textbooks were mainly technical instructions including how to make specific products, the characteristics of materials and how to maintain tools and equipment, for example, instructions for how to use a sewing machine (Thokyo Shoseki; 2007a; 34,35). I gained the impression that students were required to learn how to make things skilfully and well and this linked strongly to the definition of craft as skilled knowledge used in the research.

4. 4. 3 Aims

In these Courses of Study, the main aim was to foster competences needed in domestic life through practical activities involving producing and repairing things and develop attitudes as a member of family (MEXT, 1999d). It was stated that;

> Through practical and experimental actives related to clothing, food and shelter, students should increase their interest in domestic life, acquire basic knowledge and skills for everyday life and develop a practical attitude developing domestic life as a member of family.
>
> 衣食住などに関する実践的・体験的な活動を通して，家庭生活への関心を高めるとともに日常生活に必要な基礎的な知識と技能を身に付け，家族の一員として生活を工夫しようとする実践的な態度を育てる。
>
> (Course of Study for Home Economics, MEXT, 1999c; 11)

Although the documents kept mentioning the basic knowledge and skills needed for domestic life, I did not find any detailed explanations of what these are. These school subjects focused on practical learning more than Art & Handicraft and Art but were most concerned with the teaching knowledge and skills needed in domestic life.

4. 4. 4 Types of crafts

References to types of craft identified in the Courses of Study and textbooks were textiles and wood and metal crafts. The main types of craft materials identified were

textiles in Home Economics and wood and metal in Technology. All the exemplary products were functional, for example, bags (Kairyudo, 2007a), *hanten* (a traditional Japanese jacket) (Tokyo Shoseki, 2007c), and CD racks (Tokyo Shoseki, 2007b). The specific materials identified in Home Economics textbooks for secondary schools were fabric, string, felt, dyes and wools (Tokyo Shoseki, 2006b, c). Technical instructions were for sewing, embroidery and knitting, for example, how to sew the hem of trousers (Kairyudo, 2007c). The materials in the technology textbooks mentioned were wood, metals and plastics including *sugi* (Japanese cedar), *hinoki* (Japanese cypress), soft steel, cast iron, synthetic resin (ABS) and polycarbonate (Kairyudo, 2007b, Tokyo Shoseki, 2007b). The tools and equipment mentioned for working with these materials including planes and drilling machines (Tokyo Shozseki, 2007b). Examples of technical instructions were making a half lap joint (あいがきつぎ) or a mortise joint (通しほぞつぎ) (Kairyudo, 2007b; 41, Tokyo Shoseki, 2007b; 37). I found that materials, tools and techniques were specified more closely in these subjects than in Art and Art & Handicraft.

4. 4. 5 Content, activities and teaching and learning strategies

When I searched for references for craft teaching and learning in the Courses of Study, I found two learning objectives seemed important for this research. They were;

> Teachers should enable students to experience the enjoyment of working and learning through practical activities.
> 実践的、体験的な学習活動を中心とし、仕事の楽しさや完成の喜びを体得させるようにすること。
> Teachers should teach students problem solving connected to everyday life.
> 生徒が自分の生活に結びつけて学習できるよう、問題解決的な学習を充実すること。
>
> (Course of Study for Technology & Home Economics, MEXT, 1999d; 82)

The first objective is important because it encourages development of skilled knowledge and the second because it could develop design thinking.

Problem solving strategies were explained in all the textbooks. The stages in the problem solving process were: (i) identification of a problem in everyday life; (ii) research; (iii) planning; (iv) solving a problem and (v) reflection. One example follows: (i) 'Let's look at everyday life and find a problem' (生活を見つけ、問題を見つけよう); (ii) 'Let's do research (to understand the problem)' (調べてみよう); (iii) 'Let's plan (to solve the problem)' (計画を立てよう); (iv) 'Let's carry out' (実行しよう) and (v) 'Let's reflect on your learning and use what you learned in every day life' (ふり返り、生活に生かそう) (Kairyudo, 2007a; 16, 17). Problem solving appeared to be the central learning and teaching focus in this subject.

In both the subjects, general making processes and techniques were explained first and followed by examples of projects. One textbook included a chapter called 'realizing images through making' (イメージを形にする) (Kairyudo, 2007c; 96-119). The introduction stated;

> In making clothes by hand, you can design and make using your favourite fabrics or other materials. Let's learn about processes in making clothes and make your own.
> 手づくりの衣服は、好みの布や材料を使い、自分らしくデザインしてつくることができます。一枚の衣服が出来上がるまでの行程を知り、自分の衣服をつくってみましょう。
> (Kairyudo, 2007c; 98)

The procedure for learning and learning contents was spelled out as follows:

1. A challenge to make clothes (衣服づくりにチャレンジ)
    ①. Let's think of original designs for clothes (オリジナルデザインを考えよ

う)

②. Let's understand the construction of clothes (衣服の構成を知ろう).

③. Let's measure up you for clothes (採寸をしよう).

④. Let's select patterns for clothes (型紙を選ぼう).

⑤. Let's prepare materials and tools (材料と用具を準備しよう).

⑥. Let's cut cloth and mark cloth (裁断としるしをつけよう).

Basic sewing techniques (基礎的な縫い方).

Additional knowledge: how to sew thick or stretchy cloth (発展 : 厚地や伸びる布に適するすそ野のしまつのしかた).

Let's prepare to use a sewing machine (ミシン縫いの準備をしよう).

⑦. Let's try to sew clothes (縫ってみよう).

Examples of exercises; making a pair of short trousers, a T-shirt, or a *chanchanko* (traditional jacket) (実習例１ハーフパンツ、実習例２T 型シャツ、応用例、ちゃんちゃんこ).

⑧. Let's finish it (仕上げをしよう).

⑨. Let's try it on (着てみよう).

2. Express yourself – arrangement (自分らしさを表現するアレンジ).

Further challenges: let's dye cloth with onion skins (発展：たまねぎの皮で染めてみよう).

Summary of leaning (学習のまとめ)

(Kairyudo, 2007c; 98)

Students were expected to start this project by designing an original idea. They had to decide what to make considering purpose, place and time the clothes they wore, and cost. They were recommended to look at different styles of clothing. Another textbook suggested students look at existing products and considering their needs in everyday life (Tokyo Shoseki, 2007c). Each section explained materials and tools or basic techniques for making. For example, there were explanations of *hitaori* and *ayaori* (different kinds of weaving) (2007c; 106). Technical instructions were included, for instance, how to make a pair of shorts (2007c; 11). Questions were posed to help

students reflect on their work and products; for example, ‘Let’s think why you have to sew twice in the same place’ (2007c; 111). There was a section for *futikaeri* (reflection on learning) at the end of this chapter (2007c; 119). The five questions for reflection included, ‘Did you understand the construction of clothes?’ (体をおおう衣服の構成がわかりましたか。) and ‘Could you think of an original design?’ (自分らしい「オリジナルデザイン」をかんがえることができましたか。) (2007c; 119). *Furikaeri* could be considered a form of self-evaluation but was more subjective than in England and I gained the impression that acquiring making techniques was the priority. The skilled knowledge and design processes identified in this textbook were more structured than in the textbooks for Art and Art & Handicraft although there was an emphasis on ‘original design’.

I studied the textbooks in more depth to look at how the contents were organized, project titles and topics, types of projects and exemplary work. The contents were organized around the learning activities and aims stated in the Courses of Study and making things were understood as an everyday activity. The textbooks were organized into sections referring to making things out of different kinds of materials. For example, a Home Economics textbook for secondary schools had a chapter called ‘Making our clothes’ (私たちの衣服製作), with three set of projects: ‘Let’s understand the construction of clothes’ (衣服の構成を知ろう), ‘Let’s plan to make them’ (製作の計画を立てよう) and ‘Let’s make them’ (つくってみよう) (Tokyo Shoseki, 2007c; 11). They were different from the Art and Art & Handicraft textbooks and more akin to technical instruction books.

The names and themes of the chapters in the textbooks included ‘Making something with textiles’ (布で作ってみよう) (Kairyudo, 2007c; 27-33), ‘Our clothes making’ (私たちの

衣服製作) (Tokyo Sgoseki, 2007c; 110-129) and 'Let's make use of techniques for making everyday things' (ものづくりの技術を生活に生かそう) (kairyudo, 2007b; 20-90). They were descriptive not metaphorical like the ones in Art & Handicraft and Art and mentioned the function or name of a product.

All the photos of exemplary work in the textbooks were of functional products for use at home; for example, an apron and bag (Tokyo Shoseki, 2007a; 38- 73), a T-shirt and pair of trousers (Kairyudo, 2007c; 112,113& Tokyo Shoseki, 2007c; 120, 121) and a CD rack (Kairyudo, 2007b; 47, Tokyo Shoseki, 2007b; 47) (Figures 4. 11 & 4. 12). Students in Home Economics at secondary level were taught how to make traditional Japanese garments. I did not think the exemplary work was original but it was made skilfully and well.

Figure 4. 11 Rack (Tokyo Shoseki, 2007c; 54)

Figure 4. 12 Shirt (Tokyo Shoseki, 2007c; 122)

4. 4. 6 Resources

There were no teaching resources mentioned in the two Courses of Study. The textbooks had exemplary projects and that might be helpful for teachers. No use of external resources such as museums and galleries and craftspeople was identified.

4. 4. 7 Assessment

I searched the document for *Shidoyouroku*. In Home Economics and Technology & Home Economics, there were four aspects of students' performance or expected outcomes teachers and schools had to consider when they graded student work. The first was a positive attitude towards domestic life.

> Students should have an interest in life and technology and try to develop them.
> 生活や技術について関心をもち，生活を充実向上するために進んで実践しようとする。
> (Technology & Home Economics, MEXT, 2001; Appendix II)

The second referred to problem solving skills.

> Students should be able to examine the relationship between life and technology, identify and solve problem s by themselves creatively.
> 生活について見直し，課題を見付け，その解決を目指して自分なりに工夫し創造する。
> (Technology & Home Economics, MEXT, 2001; Appendix II)

The third referred to basic skills for life.

> Students should be able to acquire necessary basic skills for life.
> 生活に必要な基礎的な技術を身に付けている。
> (Technology & Home Economics, MEXT, 2001; Appendix II)

The fourth was about knowledge and understanding and seemed to refer to skilled knowledge.

> Students understand basic things about the relationship between life and technology and have basic knowledge about them.
> 生活や技術に関する基礎的な事項や生活と技術とのかかわりについて理解し，知識を身に付けている。
> (Technology & Home Economics, MEXT, 2001; Appendix II)

I concluded that design thinking and skilled knowledge were included in the assessment guideline in these policy documents.

4. 5 Summary of findings

In the policy documents for Art and Art & Handicraft, *kogei* and *kosaku* were specified as distinctive art forms. *Kogei* was used to refer to making things taking into account function, beauty and knowledge of materials and tools. In *kosaku,* students were expected to make artefacts for expressive and aesthetic reasons and to explore materials and tools. The teachers I interviewed understood these terms the same way. However, the primary school art teachers criticised the lack of creativity in *kogei*. In the policy documents of Home Economics and Technology & Home Economics I studied later, *seisakusuru* and *monozukuri* corresponded with making things.

It appeared that design thinking understood as generating and developing original ideas was promoted in the policy documents but not explained or taught very much in four school subjects. The term *dezain* (design) tended to be associated with 'functional products for industry' and 'planning to make and decorate products'. Those ideas do not explain design thinking fully in terms of processes of developing ideas. On the other hand, there was a strong emphasis on developing knowledge and understanding of materials, tools and processes in both policy and practice.

The crafts identified were made out of wood, clay, paper and metal in Art and Art & Handicraft. Wood and metal were used in Technology and textiles were used in Home Economics. Woodwork was commonplace. More traditional Japanese crafts than contemporary artist crafts were mentioned in the textbooks for Art.

There were no explanations of how to teach design thinking in any of the documents.

The design processes I observed in schools were prescribed and inflexible, particularly at secondary level. I did not see students conducting individual research in contrast to England. The teachers talked about history of craft or explained techniques and provided handouts. They all understood showing exemplary work by students and craftspeople as the most effective way of helping students to generate and develop their own ideas. Some teachers mentioned the need to find a balance between closed and open themes and choose topics that interest students.

Demonstrations by teachers to students either individually or groups and observations followed by practising techniques were understood as the most effective way of teaching skilled knowledge. I witnessed teachers showing exemplary work by students for the purpose of developing skilled knowledge and step-by-step instructions being distributed in handouts. Some teachers prioritised teaching techniques because they felt this was essential before students could develop their own ideas.

The use of craftspeople in residence and museums and galleries was suggested in the policy documents for both primary and secondary levels but the teachers told me it seldom occurred in schools. They organized slightly longer craft projects than in the English schools. Furthermore, I gained the impression that they were more concerned about student motivation. All the teachers told me it was important to find the right balance between rules and freedom in developing students' design thinking and skilled knowledge.

Compared with the ones in England, their art rooms in the primary schools were well

equipped. This was not the case in the secondary schools. All the schools had electric or gas kilns for pottery and cloisonné and the schools provided all the basic materials and tools students needed. I observed the use of commercial kits, particularly, at secondary level.

Unlike England, not only the secondary school art teachers, but also the art teachers in primary schools had specialist degrees in art or art education. They believed that they needed to practise making skills so as to be able to teach them better.

In Japan, assessment was not standardized and there were no national exams as opposed to England. The assessment criteria in the policy documents covered both design thinking and skilled knowledge but they were not clearly explained. Interest, the criteria of enthusiasm, attitude and competence in art appreciation were identified exclusively in Japan.

The exemplary work by students in the textbooks for all the subjects I studied was skilfully made. The students in class worked very carefully and were guided by their teachers. I gained the impression that they understood it was important to make things well technically.

In both countries, the policy emphasised developing thinking skills. However, the Japanese teachers valued craft education in schools for developing students' bodily skills and sense of touch, and providing them with opportunities to experience the pleasure of making and hard work. I concluded that there was more emphasis on teaching skilled knowledge than on design thinking in Japan.

CHAPTER 5
COMPARISON AND INTERPRETATION

5. 1 Introduction

The aim of the research reported in the first part of this chapter was to compare craft education policy and practice in schools in England and Japan, so that I could determine the main similarities and differences. In the second part of this chapter, I reflect on and explain them in the light of theory in the literature and the research questions.

In this part of the research I revisited the data collected in the two countries as reported in the descriptive chapters 3 and 4 and compared it. The descriptive chapters constituted the first level of data interpretation. The first part of this chapter reports the second level of data interpretation. At this stage in the research I systematically documented and described similarities and differences in policy and practice in the two countries. The purposes were to establish what these were and second to enable me to consider strengths and weaknesses in craft education policy and practice and to identify key issues in need of future explanation and analysis in the second part of this chapter. Because the context for craft education in the two countries was so different it could not be a direct comparison. For example, in the descriptive chapters, I reported how the terms ‘making’ and ‘working with materials and tools’ were used in English policy documents because they did not use the term ‘craft’ as I had defined it for this research. In Japan I reported how the terms *kogei* and *kosaku* were used, which translate directly into English as ‘craft’ or ‘handicraft’.

The main aim of the final stage of data interpretation was to make meaning from the data by reflecting on and questioning selected key findings from the comparison in the light of existing theories of craft and craft education. I reduced the comparative data reported in the first part of this chapter in order to reflect on this more deeply having identified the most important interpretive themes. I identified five themes for further analysis. In the second part of this chapter, I organize them into five headings and investigated the relevant data together with theories I identified in the review of literature and the review had to be updated at this stage of the research.

5. 2 Comparison of craft education in England and Japan

5. 2. 1 Concepts of craft

The aim of the comparison was to determine similarities and differences in concepts and perceptions of craft and craft activities in schools in the two countries and consider them in relation to my own definition. At the beginning of this research, I defined craft as knowledge of how to create artworks skilfully and well through manipulating and controlling materials, tools, equipment and processes. I defined it as a distinctive form of skilled knowledge in the same way as Houghton and Mason (2002) did in their previous study on western craft education. However, at this point in the study it was necessary to reconsider this definition in the light of some of the comparative findings from the two countries and examine their relevance and appropriateness for craft education policy and practice, particularly in Japan.

In the policy documents I studied in England, the concept of ‘craft’ was never clearly defined, so I assumed the terms ‘making’ and ‘producing’ were substitutes. However, I

could not tell if these were really compatible with skilled knowledge as I defined it at the beginning of the research. In Japan, the concepts of *kogei* and *kosaku* were clearly defined in the policy documents and were compatible with my definition.

In both countries, observations of craft lessons gave me a fuller understanding of the concept of craft and craft making activities than analysis of policy documents would have done alone. Craft activities in lessons in Japan emphasised teaching skilled knowledge more than in England. However, in England craft activities incorporated 'design' as an important element, which was not the case in Japan. Although 'skilled making' was referred to either directly or indirectly in both countries, design was the key learning concept in England. In England, craft activities seemed to be embedded in other kinds of art activities rather than understood as an independent learning domain. In contrast, *kogei* was understood as a distinctive learning domain and activity in Japan.

Recurring definitions of craft by teachers of both the subjects I studied in England and of *kogei* and *kosaku* in Japan were that it is practical and involves 'skilled making'. Art teachers in Japan commonly referred to *kosaku,* but not to *kogei,* as a 'creative' activity. One difference was that teachers' perceptions of craft were more diverse in England than in Japan. In England, craft was understood differently by policy makers and teachers. The policy and practice for craft education in England emphasised design thinking but the teachers emphasised skilled making more. However, in Japan, policy and practice were consistent and both policy makers and practitioners emphasised skilled knowledge.

Table 5. 1 Concepts of craft, *kogei* and *kosaku*

England	Japan
Policy documents	
The term craft only appeared in one national curriculum subject (A&D) but was not distinguished from art or design. The concept was not defined in either subject. I interpreted the terms 'making' (A&D and D&T) and 'producing' (D&T) as 'craft'.	The terms *Kogei* and *Kosaku* appeared in the Courses of Study for two school subjects (Art, A&H). *Kogei* and *kosaku* were defined as follows: *Kogei*: 'making something functional and beautiful using knowledge of techniques and individual ideas' (Art). K*osaku:* 'making using knowledge of materials and tools' (A&H). The terms *monozukuri* (making things) and *seisakusuru* (producing) were interpreted as craft given that this research defined it as skilled making.
Curriculum guidelines	
The term craft appeared in Schemes of Work for A&D. The concept was ambiguous and IT was understood as an element of art or design. However, art and design activities involved manipulating visual and tactile qualities of materials and processes while considering ideas and purposes. Students were expected to make craft objects for expressive and aesthetic reasons. The term 'craft' was not used in D&T but students were expected to make functional and utilitarian products for commercial enterprises (e.g. carrying devices, T-shirts). This could be interpreted as	The terms *kogei* and *kosaku* appeared in the textbooks. The concepts were the same as the ones in the policy documents and distinguished from other fine art (painting & sculpture). In *kogei,* students were expected to make functional artefacts for aesthetic reasons and for use in everyday life (e.g. musical boxes). Industrial products were not included. In *kosaku*, students were expected to make artefacts for expressive and aesthetic reasons and explore materials and tools (e.g. the material properties of clay). The terms *monozukuri* (making things) and *seisakusuru* (producing) were used

skilled making.	for making functional objects for use in everyday life/ domestic life in T&H (e.g. bookshelves, T shirts).
Craft education practice	
Acquiring skilled knowledge was not the main aim in A&D. There was more emphasis on skilled knowledge in D&T than in A&D The emphasis was mainly on design design/thinking and creativity in both subjects. The stated purposes in A&D were to make expressive and aesthetic objects and the focus was on contemporary artist-crafts (non-functional) (e.g. hats by Philip Tracy). The stated purpose of craft education in D&T was to make functional and utilitarian products for commercial enterprises (e.g. photo frames, summer dresses).	Acquiring skilled knowledge was the main learning outcome in all four subjects. Design thinking was not taught. The stated purposes of craft education in Art were learning about traditional Japanese functional objects (e.g *kamakurabori,* pot-stands) and appreciating them for aesthetic reasons (e.g. *kamakurabori,* pot-stands). The stated purposes of craft education in A&H were creating 'original' objects (e.g. chairs that are non functional) for expressive reasons.
Teachers' conceptions of craft	
Their conceptions of craft varied and differed the policy and support documents. Two recurring definitions were 'making something functional by hand' and 'a skilled activity'. Some A&D teachers understood craft as a creative activity but their reasons for this were unclear. Some D&T teachers considered the term 'old fashioned'. They dismissed craft education because they thought it was prescriptive and limited to making the same things by hand.	Their conceptions of craft were similar to the ones defined in the CoS and textbooks. Recurring definitions were as follows: *Kogei:* teachers referred to traditional processes and materials used to make functional and utilitarian objects. *Kosaku:* teachers referred to making objects using knowledge of materials and tools and original ideas.

(A&D = Art & Design, D&T = Design & Technology, A&H = Art & Handicraft, T&H = Technology & Home Economics, NC = National Curriculum, CoS = Courses of Study)

5 .2. 2 Concepts of design thinking

In this section, I present the comparative findings about design thinking. At the beginning of this research, I defined design thinking as a process by which craftspeople generate and develop their own ideas. As the term 'design thinking' did not appear in any of the policy documents or curriculum guidelines I studied, I explored how ideas and practices discussed in the documents linked to the original definition of design thinking developed for this research.

Although the terms 'design' and '*dezain* (design)' were both included in the National Curriculum in England and in the Courses of Study in Japan, it was not clear whether they referred to design thinking in the way I had defined it or not. In England, design was clearly understood as a distinctive activity, separate from 'making'. The two curriculum domains of *kogei & dezain* in Japan stressed the importance of students generating and developing their own ideas, as well as considering function and using their imagination. In both countries, the policy documents emphasised creativity, and generating and developing original ideas. However, the specifications for teaching design thinking were more detailed in the English documents compared to the Japanese ones.

The terms 'design' and *dezain* appeared in exemplary schemes of work in England and textbooks in Japan and were explained in detail. In Japan, *dezain* appeared to be associated with 'decorating the surfaces of functional products produced for industry' and 'planning to make products'. This does not explain design thinking fully in terms of the processes involved in developing ideas. However, once again, this aspect of design thinking was emphasised much more in the policy documents from England than Japan.

In England, the stress was on teaching distinct stages in the design process in both school subjects, but the explanations of design stages were more detailed in Design & Technology than in Art & Design. The design stages of 'individual research' and 'self-evaluation' were emphasised strongly. One design stage that was evident in Japan was *kanso* and *furikaeri*. In *kanso* and *furikaeri,* students were expected to reflect on and evaluate their work subjectively rather than objectively. Whereas the term *dezain* did not appear in the policy documents for Home Economics and Technology & Home Economics, the textbooks for these subjects did refer to specific problem-solving processes.

Some teachers I interviewed in both countries claimed that the main purpose of craft education in schools is to foster creativity or facilitate original ideas. However, I did not see design thinking (understood as creative thinking) being taught in Japan. Teachers in England promoted and taught design thinking in both subjects. In Art and Design students researched individual artists and their work in books and on the Internet. In Design & Technology, they investigated products and materials in a similar way or visited shops and performed market research using questionnaires. However, I did not see any students in Japan conducting individual research. Regarding self-evaluation, students in England were expected to analyse their own and other people's work and make judgements of their quality using evaluation criteria they developed throughout the projects. The *kanso* I witnessed in Japan was a form of self-evaluation also, whereby students completed written reflections on their own and each other's work. However, they did not refer to design thinking and their *kanso* were less critical and analytical than the self-evaluations of students in England.

Table 5. 2 Concepts of design thinking

England	Japan
Policy documents	
The term design was mentioned in both national curriculum subjects. Two definitions of design were identified as follows; one was in relation to artworks and did not distinguish from art or craft clearly (in A&D only) and the other referred to an activity separated from 'making' (both subjects) but there was no explanation of how. The emphasis on creativity was common to both subjects. There was an emphasis on individual research by students and self-evaluation in both subjects, but the descriptions of the design processes in D&T were more detailed than in A&D.	The term *dezain* (design) was mentioned in Art and A&H but not in Home Economics and T&H. *Kogei & dezain* activities in Art were generally understood to include generating and developing creative ideas taking into account both function and imagination. In A& H, *dezain* was understood to be a 'creative competence'. The emphasis on *souzosei* (creativity) and developing unique ideas were common to Art and A&H but not the other subjects.
Curriculum guidelines	
The term 'design' appeared in the schemes of work for both subjects. The emphasis was on creativity and design thinking in both subjects. Precise steps in design thinking, including individual research by students and self-evaluation were specified and explained in both subjects but more fully in D&T.	The term '*dezain'* appeared in the textbooks for Art and A&H. The main emphasis in Art and A&H was on developing unique ideas. *Furikaeri* (reflection on learning) was recommended in all four subjects. Explanations of problem solving processes were provided in Home Economics and T&H.
Craft education practice in schools	
The emphasis was on design thinking in both subjects. Researching artists and their work was emphasized in A&D, and researching	No emphasis on design thinking in Art or A&H and no individual research. Students were expected to write *kansou* (subjective impressions/ feelings about

products and identifying needs were emphasized in D&T. Self-evaluation was emphasized strongly in both subjects. Students were expected to conduct reflect on and critically evaluate their work processes and objects.	their work and learning) in both subjects.

5. 2. 3 Purposes of craft education in schools

The findings about the aims and objectives of craft education as stated in policy documents and teachers' briefs were compared so as to be able to reflect on how teachers tried to develop students' design thinking and transmit skilled knowledge. I could not find specific objectives for craft in any policy document. Consequently, I researched the general educational aims for all school subjects as well as the specific aims for the six subjects studied in depth because I thought they might reflect ideas that are relevant for craft education.

Creativity and creative problem solving skills were general educational aims in both countries. However, only the English policy documents included developing thinking skills explicitly as an aim and I understood this as supportive of the emphasis on design thinking in A&D and D&T. In Japan, 'creativity', understood as autonomous learning, was emphasised as a general educational aim. The priority afforded to developing literacy and numeracy skills in England was reflected in the writing I observed happening in craft lessons there, which I did not see in Japan. A strong emphasis on craft as a vehicle for cultural learning was apparent in the policy documents in both countries but interpreted very differently. In England, educational policy on culture was

multicultural and in Japan, it was mono-cultural and centred on learning Japanese culture. The English national curriculum aims were more vocationally oriented and did not refer to personality and/or character development in the same way as in Japan.

Regarding subject specific aims, creativity was a broad educational aim for both the subjects studied in England and for Art and Art & Handicraft in Japan. Developing critical thinking skills was emphasised in both subjects in England and feeling and aesthetic sensitivity in Art and Art and Handicraft in Japan. It was clear there was more emphasis on developing thinking skills (design thinking) in England than in Japan.

Teachers in both countries told me that it was important to teach craft in schools so students could develop making skills that are useful in everyday life. Japanese policy documents stated that it is important that they experience the enjoyment of making, as did some of the teachers I interviewed in England. Unlike England however, practice reflected policy in Japan in emphasising the development of skilled knowledge.

Table 5.3 Purposes of craft education in schools

England	Japan
Policy documents	
General educational aims in all school subjects: developing students' creativity, thinking skills and literacy and numeracy and citizenship; understanding diverse cultures and preparing students for future employment. Subject specific aims: developing analytical thinking skills in both subjects; developing creativity and imagination in	General educational aims in all school subjects: developing *ikiruchikara* (zest for life) as autonomous learning; understanding Japanese culture and fostering a good character or personality. Subject specific aims: learning art for life long education; developing students' creativity, an emotional response and basic making skills in Art and A&H and

A&D; developing creative problem solving and autonomous learning skills in D&T.	developing students' understandings and skills for domestic life in Home Economics and T&H.
Teachers' views	
Teaching craft in schools is important for: (i) students' future careers; (ii) experiencing the enjoyment of making and (iii) developing practical skills for use in everyday life.	Teaching craft in schools is important for: (i) learning how to make concrete artefacts with original design and manipulating materials and tools (Art, A&H) and (ii) how to make functional objects for use in everyday life (Art).

5. 2. 4 Types of crafts

I compared the findings about types of crafts in the policy documents and curriculum guidelines with the findings from the fieldwork. I realised it was important to understand what types of crafts, craft objects, craft materials, techniques and processes were actually being taught; for example, if they were traditional or contemporary and whether they were appropriate choices for craft education in schools. Unfortunately, I was only able to observe a few craft lessons in England, so the data I collected was limited.

In Japan, the policy documents mentioned wood, metal & paper crafts and pottery in Art & Handicraft and Art and textiles, wood and metal crafts in Home Economics and Technology & Home Economics. The use of familiar materials and materials from the local district was recommended in Art and Art & Handicraft. In the policy documents, materials were classified as either 'resistant' or 'compliant' in Design & Technology, and as 'print', 'textiles' or 'paper' in Art & Design. In contrast to Japan, English policy documents advocated the use of ICT (CAD/CAM) as a contemporary method of making things. In Japan, the stress was on the enjoyment of making craft objects by hand from

start to finish and this was considered significant because in contemporary society people no longer make things themselves.

Types of crafts and materials and techniques were explained in detail in the curriculum guidelines (the schemes of work and textbooks) for all the school subjects. However, I could not imagine what types of crafts were actually being made in schools just from reading the documents in England. I understood it might be a policy in England not to name specific crafts, so as to give students more freedom to choose how they want~~ed~~ to work, and to emphasise process rather than product. In Japan, woodcraft was common to all the subjects I studied and in England, textile crafts were common to both subjects. The craft objects produced in Art and Design & Technology tended to be functional (for example a pot stand) whereas the objects made in Art & Handicraft in Japan and Art & Design in England were made for expressive and aesthetic reasons and were non functional (e.g. sculptures made of clay using the theme of 'natural forms'). Textiles, clay, paper and wood were common materials and students were taught specific skills and techniques for working with them, such as different kinds of sewing stitches and methods of joining pieces of wood. Some craft materials and techniques, such as *urushi* and woodcarving, were exclusive to Japan. Techniques for researching the Internet for information about crafts and using CAD/CAM to design crafts were taught in England but not in Japan.

Although all the craft objects students made in Art in Japan and Design & Technology in England were functional, Japanese art teachers' main concern was how to use craft materials and techniques for decorative purposes. They often supplied students with

commercial kits with ready-made objects. In one project, I observed students were given a ready-made musical box and decorated the surface with carving or *urushi*. In practice, therefore, function was not important in *kogei*, even though it was a stated aim. In England, students experimented with different kinds of craft media, materials and techniques and combined them in lessons but this was not the case in *kogei*. In Japan, students tended to use craft materials and techniques in traditional ways rather than to experiment and the most popular types of craft were Japanese woodcrafts, including carpentry and wood printing in *kosaku* and woodcarving and lacquer crafts in *kogei*. This emphasis was more evident in practice than in the textbooks. The techniques involved in all these crafts are complex and they make use of specific materials. However, these were not always authentic. One explanation for this is that *urishi* produces a skin rash, so schools have to use artificial lacquer for safety reasons. Another is that authentic materials are expensive. Consistent with the policy and curriculum guidelines, I observed students using the internet for individual research in both subjects studied in England but they only used CAD & CAM in Design & Technology.

Table 5. 4 Types of crafts

England	Japan
Policy documents	
No particular types of craft were named in A&D or D&T. Materials& techniques for 'craft' were hardly mentioned at all in A&D. Materials were categorised into two main types in D&T: resistant and compliant (plastic and textiles).	The following types of crafts were named in the CoS for all the school subjects. Wood, metal, paper and clay in Art and A&H. Textiles in Home Economics and wood &metal in T&H. The use of everyday and local materials was recommended for projects in Art and

The use of ICT was recommended in both subjects as one way of 'making' (e.g. CAD/CAM). It was not clear if students had to make craft objects from start to finish in either subject. Students were required to learn about a range of crafts from 'different times and places' in A&D and 'products for commercial enterprise and industry in D&T.	A&H (e.g. clay, stone, wood, and paper from local areas). The use of ICT was recommended in Art and A&H (e.g. digital cameras) but not in *kogei and kosaku*. Students were expected to make craft objects from start to finish by hand and to enjoy this experience in Art and A&H. Students were required to learn about crafts in everyday life and traditional Japanese craft in Art and A&H.
Curriculum guidelines	
Objects, materials and techniques were mentioned in both subjects but there were no visual examples or detailed instructions. The objects that students were expected to make were non-functional and made for aesthetic and expressive reasons in A&D (e.g. 2 or 3-D objects from ideas from stories in Key Stage 2). The main types of materials suggested for craft in A&D were textiles (e.g. wool, fabric), clay (not specified) and paper (e.g. cardboard). The main techniques in A&D were: stitching, sewing (textiles), making clay slabs (ceramics) and papier-mâché (paper). The objects students were expected to design and make in D&T were functional commercial and/or industrial (e.g. a range of garments, computer mouse or kit rack made from resistant materials.	Objects, materials and techniques were explained in detail in Art and A&H. *Kogei* objects were functional (e.g. a pot stand) but the main emphasis was on an aesthetic quality. Not all *kosaku* objects were functional and making them was advocated for aesthetic and expressive purposes (e.g. wooden sculpture). The main types of material used in *kogei* & *kosaku* in Art and A&H were: clay (e.g. for pottery), wood (e.g. bamboo), paper (e.g. Japanese paper) and others (e.g. stone, glass, fabric). The main techniques specified for *kogei & kosaku* in Art and A&H were: hand-twisting, coiling, mosaic (ceramics), sawing in *kosaku* and carving techniques such as *katagiribori* in *kogei* (wood), papier-mâché, pop-up card techniques (paper) and others (e.g. stained glass). Traditional Japanese craft techniques were emphasised in Art and A&H (e.g.

The main materials in D&T were textiles (e.g. natural or synthetic), wood, metals and plastic (e.g. acrylic, plywood, MDF). Examples of recurring techniques specified in D&T were: dyeing, embroidery, appliqué (textiles), polyester resin, enameling (metal), cutting, line bending, (plastic) and sawing curved lines with a coping saw (wood). Students did not have to make a product by hand from start to finish. They could use processes associated with mass production (e.g. manufacture one-off or batch productions) in D&T. Learning ICT skills (e.g. how to search Internet and use CAD/ CAM) was emphasised strongly in D&T.	*Bingata,* a dyeing technique from Okinawa). In T&H, students were expected to make or mend functional products for use in domestic life (e.g. T-shirts, trousers). Textiles were the main craft materials in Home Economics (e.g. cotton, felt) and wood (e.g. Japanese cedar), metals (e.g. soft steel, cast iron) and plastics (e.g. polycarbonate) in Technology. The main techniques taught in Home Economics and T&H were: sewing, embroidery (textiles), ways of joining wood and techniques for cutting metals and plastic. Students had to make products from start to finish in Home Economics and T&H. They had to make traditional crafts (e.g. *hanten*, a traditional Japanese piece of clothing). Hand making was afforded priority.
Teaching practice	
I saw non- European crafts being taught in A&D (e.g. Malaysian batik). Students were being introduced to work by Contemporary artist-craftspeople (e.g. Philip Tracy, a hat designer). Aesthetic and expressive objects were made in A&D (e.g. a pillow from a theme, 'everyday scene' in GCSE). Functional products for commercial enterprises were made in D&T (e.g. a photo frame for a museum). Industrial production processes were	I saw a lot of Japanese craft techniques being taught (e.g. *tuishu*, a kind of lacquer technique) particularly in Art. Objects were made for aesthetic and expressive purposes in A&H (e.g. woodprints of imaginary Japanese gods). Utilitarian objects were made in *kogei*. The materials used most often in *kogei & kosaku* were wood (e.g. bamboo, cork) and clay (e.g. clay for pottery). Others used less frequently were: paper (e.g. card, Japanese paper), metal (e.g.

taught in D&T (e.g. batch production) but not in A&D. Materials I saw being used in A&D were clay (e.g. clay for ceramics), textiles (e.g. recycle cloth, cotton), paper (e.g. card board) and others (e.g. willows, wires). The main techniques I saw being taught in A&D were making tiles and coiling (ceramics), stitchery (e.g. running, back, cross, blanket and chain stitch), beadwork and tie-dyeing, (textiles) and papier-mâché and pop-up card techniques. Students were encouraged to experiment with materials and techniques in A&D. The materials I saw being used in D&T most were: textiles, metal, wood, paper and plastic. The main techniques being taught in D&T were machine sewing (textiles) and construction and processing techniques (e.g. how to bend wood). The teachers did not use commercial kits in either subject. The craft objects the students made in A&D were experimental and original. The ones in D&T were usually made better.	copper, wire), leather, glass, natural materials (e.g. stones, shells) and recycled materials (e.g. fabric). Some techniques taught in *kogei & kosaku* were very complex because they were specific to the craft concerned. Wood related techniques were observed most in both subjects (e.g. basic carpentry techniques such as cutting wood with electric/hand saws, carving techniques for woodprints and relief). Commercial kits with some ready-made parts were being used frequently (e.g. the box for *raden* was already constructed). The teachers told me some traditional craft materials are dangerous, too expensive for schools or too difficult to get hold of (e.g. *urishi*). Student work was skilful but standardized, and it resembled the examples shown by teachers.

5. 2. 5 Content, activities and teaching and learning strategies relevant to art education

The findings about teaching and learning contexts, strategies and activities were compared. Because information about teaching and learning craft was not specified in the policy documents in either country, I briefly studied the general contents, activities

and strategies for each school subject.

There was a strong emphasis on individual research and self-evaluation in the National Curricula for Art & Design and Design & Technology in England. Whereas students were required to learn how to think in the school subjects I studied in England there was no evidence of thinking processes being consciously addressed in Japan. The English documents made very few references to specific strategies for teaching skilled knowledge. The use of group discussion for generating ideas, reflecting on learning and collaborating on making pieces of craftwork was recommended in Japanese policy. Policy documents in both countries suggested the use of museums and galleries and people outside schools.

Strategies for developing design thinking were clearly identified in the schemes of work in England but not in the textbooks in Japan. In Art & Design, project themes consisted of only a few words but the design briefs used in Design & Technology were more detailed and included specific aims, materials and costs for producing a product. The project titles in Art & Handicraft in Japan were playful and metaphorical and/or simply named a technique or product in Art. In both countries the use of exemplary work by students and craftspeople was considered important for developing design thinking and/or skilled knowledge. Self-evaluation was recommended in England and *kanso* and *furikaeri* in Japan. Individual research into artists or products was required in every project in England. Technical instructions showing how to make something step by step were included in every project in Japan. In England, experimenting with techniques on small-scale works and focused practical tasks were recommended.

I witnessed teachers handing out project themes and briefs to students in England and project titles and outlines in Japan. The themes and briefs in England were more specific. I saw stages in the design process being taught in both subjects in England. However, they were more standardized in Design & Technology than in Art & Design, probably because the products students made in the former were intended for commercial use. I did not see the design process being taught systematically in Japan. Individual student research, which was strongly recommended as a mode of learning in Art & Design and Design & Technology policy documents, was observed in practice in England only. In Japan, teachers tended to provide students with contextual information about crafts and explain their characteristics and techniques in lecture format and provide handouts. The use of sketchbooks to develop ideas was evident in England but not in Japan. Examples of professional crafts people's work were used to motivate students' work more in England and students' work was used more in Japan. I saw teachers in both countries trying to respond to students' individual needs throughout lessons even though it was difficult with the large class sizes. I saw Japanese teachers giving students more technical instructions than in England, where they tended to leave students alone to explore materials and techniques any way they wanted.

In both countries, teachers valued showing reproductions of craftworks by craftspeople and students as a way of developing design ideas. As was the case with the policy and curriculum documents, only the teachers in England mentioned individual research. Not surprisingly, they had more specific ideas about how to develop design thinking than the Japanese teachers because they had guidelines to follow. Japanese and English

teachers both told me that demonstrations and practicing techniques were the most effective ways to teach skilled knowledge. However, in response to this question the Japanese teachers tended to mention more general aspects of delivering curricula, such as responding to students' individual needs, planning lessons for the right developmental level, group work and creating an effective learning environment.

Table 5. 5 Content, activities and teaching and learning strategies

England	Japan
Policy documents	
Individual research and self-evaluation were strongly emphasised in both school subjects. General curriculum strategies relevant to developing students' design thinking and skilled knowledge were: using A variety modes of learning such as individual and group work (A&D) and using focused practical tasks to develop a range of techniques, skills, processes and knowledge (D&T).	Experiencing the enjoyment of making and art appreciation was emphasised in Art and A&H and work and making in Home Economics and T&H. General curriculum strategies relevant to developing students' design thinking and skilled knowledge were: planning learning through the school Years so as to accumulate knowledge of making; considering students' developmental stages in planning curricula; group work (Art, A&H) and visiting museums and galleries, and use of people from outside schools (Art, A&H).
Curriculum guidelines	
The following content, activities and strategies for developing students' design thinking were identified in SoW for A&D and D&T. Setting project themes/ briefs in A&D and design briefs in D&T. Individual research using sketchbooks in both subjects. Self-evaluation in both subjects. Showing exemplary work by artists,	The following content, activities and strategies for developing students' design thinking were identified in authorised textbooks for all the four subjects. Setting project themes and descriptions of project contents that were imaginative and/or named techniques or final products. Individual and group research into products in T&H (e.g. investigating

designers and crafts people in both subjects. Teaching specific stages in design processes in D&T. Talking about a theme or responding to questions by a teacher in both subjects. Visiting museums and galleries in A&D. The following content, activities and strategies for developing students' skilled knowledge were identified in SoW for A&D and D&T: Showing exemplary work in both subjects. Teaching basic techniques (before making) in both subjects. Experimenting with techniques in small-scale work and focused practical tasks in D&T.	existing products). *Furikaeri* and *kanso* (reflective activities) in all subjects. Showing many exemplary works by students in Art and A&H (only a few exemplary works by students were shown in Home Economics and T&H). Teaching problem-solving steps (e.g. identifying and then solving A problem) in Home Economics and T&H. The following content, activities and strategies for developing students' skilled knowledge were identified in authorised textbooks for all the four subjects: Showing exemplary work in all four subjects. Following step by step 'how to make' instructions (they were more detailed in Home Economics and T&H than the other two subjects).
Teaching practice	
The following content, activities and strategies for developing students' design thinking were identified from my observations of craft lessons. Setting themes and design briefs (A&D, D&T) (e.g. natural forms in A&D). Requiring students to do individual research (e.g. research crafts people's work in A&D, research in shops in D&T). Teaching stages in the design process. (They were more standardized and fixed in D&T than in A&D.) Students used sketchbooks to communicate ideas in both subjects. Teachers showed examples of	The following content, activities and strategies for developing students' design thinking were identified from my observations of craft lessons. Setting themes and descriptions of project content in Art and A&D (e.g. making a pot stand in Art, "My chair" in A&H). A few teachers got students to use sketchbooks and notebooks for planning ideas and *kanso* in A&H and Art. Teachers showed exemplary work by students in both subjects. Teachers responded to individual needs

craftspeople work in A&D. Teachers responded to students' individual needs while they were designing and making in both subjects. The following content, activities and strategies for developing students' skilled knowledge were identified from my observations of craft lessons: Demonstrations by teachers in both subjects. Students practised techniques in both subjects. Teachers showed examples of work by craftspeople and students in both subjects. Students researching techniques in both subjects. Peer teaching in both subjects. Students using instruction sheets/ posters by a commercial company in D&T. Workbooks produced by teachers in D&T.	while they were designing and making. Lectures by teachers in A&H and Art. Teachers gave out handouts with background and historical information about crafts in Art. Students looked at peers' work in A&H and Art. Students looked at books in Art. The following content, activities and strategies for developing students' skilled knowledge were identified from my observations of craft lessons: Demonstrations by teachers in A&H and Art. Students practised techniques in A&H and Art. Teachers showed exemplary work by students in A&H and Art. Handouts made by teachers in Art. Use of sub-textbooks in Art published by commercial companies. Peer teaching in A&H and Art.
Teachers' views	
The teachers told me the following strategies were useful for developing students' design thinking: Showing reproductions of work by craftspeople, and exemplary work by teachers and peers in both subjects. Conducting individual research in both subjects. Discussing themes and artists' work in A&D. Modelling in D&T (e.g. making a small scale product with paper).	The teachers told me the following strategies were useful for developing students' design thinking: Showing reproductions of work by craftspeople and exemplary work by teachers and peers. Having a well balanced curriculum (balancing focused and open themes and familiar with topics appropriate to students' development) Group work (creating a good working environment and working relations like in

The teachers told me the following strategies were useful for developing students' skilled knowledge. Combining teacher demonstration with practice by students. Including 'learning knowledge and practical skills' in the curriculum so as to accumulate making techniques through the Key Stages.	a craftsman's workshop, discussing ideas). Emphasising process rather than end products. The teachers told me the following strategies were useful for developing students' skilled knowledge. Demonstrations by teachers. Practice by students. Developing techniques & ideas together.

5. 2. 6 Assessment

I compared the findings about assessment criteria and methods in the policy documents, lesson plans, my descriptions of craft lessons in schools and the transcripts from the interviews with teachers. The aim of this part of the comparison was to establish the best way of design thinking and skilled knowledge is and should be assessed in craft lessons and how students know when their craftwork is 'good' or 'bad.' Assessment criteria and methods greatly influence how anything is taught and learned in schools. But because the time I had to study this aspect of craft learning was limited, I was unable to compare assessment practices in depth, especially with regard to informal assessment.

In England, the National Curriculum specified attainment targets at the end of each key stage and students studied for national examinations (GCSE) in the two subjects I studied. This was not the case in Japan. At the time the research was carried out, the national examinations in England assessed student work completed over a two-year course. The ones for Art & Design and Design & Technology had two components,

coursework and a final examination (see Chapter 3). Coursework in both subjects was assessed by teachers and moderated by a local examination board and the final examination was set and assessed externally. The weighting allocated to coursework was between forty percent and sixty percent in all the schemes of assessment. In Japan, paper and pencil tests, consisting mainly of questions and answers, writing *kanso* and, in some cases, sketching, were carried out by teachers at the end of each term (two or three times a year) in the secondary schools I visited. One teacher told me that he devised questions about the processes of making *tuishu* and carving techniques, and regularly asked students to write *kanso* about their works on a test paper. Individual teachers tested students' knowledge of the content as specified in the Courses of Study. The coursework or projects conducted in Japanese schools were only assessed by the individual teachers at the end of each term and there was no external moderation.

In England, both the final pieces and the processes of their development shown in sketchbooks were assessed in the both school subjects. Design & Technology also had a pencil and paper exam. In Japan, the emphasis was always on assessing final pieces of work. Student effort and attendance, homework, lesson preparation, worksheets and final pieces of work were all assessed individually.

In England, the emphasis was on assessing thinking skills. In the National Curriculum in England, these were specified as 'exploring and developing ideas and evaluating and developing work' (Art & Design), and 'developing, planning and communicating ideas, and evaluating processes and products' (Design & Technology). The assessment criteria specified in the *Shidouyouroku* in Japan included skilled knowledge. There was

no separate criterion for skilled knowledge in England (Art & Design). In the lesson plans I saw in Japan, ‘effort’ was a very important criterion but there was no mention of this in any policy document in England. Although I did not see this happen, the teachers at one school in England told me they used the criteria and methods specified in national examinations at Key Stage 4 to assess student work at Key Stage 3 so as to prepare them for them. These national exams clearly had a big influence on the whole secondary school curriculum. However, teachers in both countries told me that they did not rely solely on criteria stated in policy documents and used their own intuition and experience to assess student learning.

In England, there was an expectation that critical discourse should be more academic and rigorous and personal opinions should be justified more in comparison to Japan. The activities of *kanso* and *furikaeri* did not require students to think about their learning objectively. For example, they were not expected to develop any criteria to evaluate their work. The student self-evaluations in Japan were more subjective and teachers were more concerned with developing aesthetic sensitivity and with students experiencing the enjoyment of making and appreciating art than in England.

The Japanese textbooks included many photographs of exemplary craft objects but this was not the case with the national curriculum schemes of work in England. In Japan, the surface decorations students created in Art were rather austere, whereas the ones they developed in Art & Handicraft were freer and more colourful. The exemplary work in Japan was excellent technically, especially in Art and Technology & Home Economics. In both countries, students made craft objects that resembled the exemplary work or the

best work by their peers'. In England, where developing individual ideas was considered very important, written descriptions of the craftwork were displayed together with final products in all the art exhibitions. In Japan, when students decorated the surfaces of objects, they did not appear to attach any meaning to this work. In lessons focusing on traditional Japanese crafts, they often copied traditional Japanese patterns or design from nature from books. Student work in the school subjects of Design & Technology in England and in Art in Japan was more skilful technically than in the other four subjects I studied.

In both countries, teachers told me that they explained assessment criteria to students at the beginning of each project and told them how and when their work was going to be assessed. The teachers I observed in England checked student sketchbooks and looked at their designs at the beginning of lessons and gave feedback during lessons. The teachers in Japan told me they kept personal records of student work, gave oral comments to them during lessons and used photography to document their working processes. In both countries, formal and informal assessment took place not only at the end of projects but throughout.

Table 5. 6 Assessment

	England	Japan
Forms of assessment	National exams at the end of compulsory schooling (GCSE). Coursework. Reports for parents (usually at end of each term) including comments and marks based on coursework.	Timed tests of knowledge and understanding of work undertaken (twice a year or at the end of a term). Coursework. Reports for parents (at the end of each term) with comments and a marks based on coursework and

		tests.
Methods	Assessed by teachers (several teachers in one school) and moderated by the exam boards.	Assessed by individual teacher (usually the one art teacher in a school).
Students' outcomes	Sketchbooks End products	Sketchbooks (sometimes). End products
Assessment criteria	The assessment criteria addressed analytical thinking skills in A&D more than in D&T (e.g. analysing and evaluating objects). Assessment of skilled knowledge was tacit in A&D and more explicit in D&T.	The assessment criteria in all the subjects might cover some aspects of design thinking (e.g. generating ideas). Assessment of skilled knowledge was clearly stated in all the subjects. 'Student' effort' was also an important criterion in Art and A&H.

5. 3 Interpretation

In this part of the chapter, five important interpretive themes identified from the comparison are discussed. They draw on ideas and research from the literature review, which were up-dated during this research.

5. 3. 1 Traditional versus contemporary concepts of craft and craft education

Historically, skilled knowledge and function are central ideas of craft and craft education. In this research, these were recurring themes informing the data about craft in schools, particularly, for *kogei* in Japan.

Since 1990s, scholars of craft as well as government policy makers internationally have emphasized creativity and developing creative thinking skills in craft education. Policy makers and scholars believed that design thinking could be developed through making.

This implies combining developing design ideas through process with concrete learning. Some scholars point out that students learn to solve problems in concrete ways through designing and making at the same time (Baynes, 1985, Owen-Jackson, 2002, Sjöberg, 2009). This notion of how to develop design ideas during the making process is based on the notion of modelling initial thoughts in the mind, or 'thinking-in action' (Kimbell and Perry, 2001). In England, craft has been understood as a low status activity for academically less able students for a long time and developing thinking skills this way was neglected in schools and society in the past (Houghton, 2000, Sjöberg, 2009). Improving understanding of how thinking skills develop during making could help to promote craft education.

According to Owen-Jackson (2002), craft teachers tend to be concerned with 'finish' and 'quality' when their students make craft objects. However, if a teacher wants to teach processes of 'designing', notions like 'finish and quality' are less important. This research found there were different aims or focuses for art making projects in schools where time is limited. Houghton (2000) mentioned that students could develop ideas through making but that each project in schools has different aims and focuses and teachers cannot teach everything at once. Perhaps, teaching design process and making have their own purposes. However, in my view, this tension between skilled knowledge and design thinking lies at the heart of craft education in schools. It is not a question of one or another.

This research found more emphasis on developing students' individual ideas in curricula in England than in Japan. Policy makers in England emphasised developing

creativity and design thinking skills above all else. More design thinking was observed in craft projects in the schools I visited in England than in Japan. One possible reason is that ‘academic knowledge’ is a priority in Western countries (Tsuneyoshi, 1994). Another is that some in contemporary artist crafts afford more importance to originality than skilled knowledge. For example, artist crafts such as soft sculpture and furniture production or toy making were commonplace in the schools I visited in England. In the former, students need to develop their own ideas and design is central to an industrial production process. Nonetheless, most English teachers I met understood craft as skilled making. Mason (2000) points out that the emphasis on thinking skills in English policy puts skilled knowledge at risk. If this dominates Art and Design lessons, craft as skilled knowledge could disappear and lose its identity as a school subject. In fact, I saw very little skilled knowledge being taught explicitly in art lessons in England.

In contrast, the research in Japan found skilled knowledge was strongly emphasised, especially learning to work with materials and tools connected with traditional crafts. Previous research found that traditional crafts were not taught in secondary schools in England and Wales (Houghton, 2000, Bedford, 2002) so this condition clearly has not changed. I believe it is important to teach traditional handcrafts because they require more skilled knowledge. Wood and lacquer crafts are frequently taught in Japanese secondary schools; for example, in *kamakurabori* projects, students carve patterns in wood using a range of techniques, lacquer it with layers of *urushi,* and then polish it. When craftsmen make craft objects they use highly skilled knowledge and make aesthetic judgements about performance and results. In lessons in schools featuring

traditional crafts, students have opportunities to demonstrate learned skills with specific materials and tools, and learn to exercise aesthetic judgements. This kind of knowledge is gained especially through making traditional craft. However, some Japanese primary school teachers I interviewed complained that traditional crafts limit students' freedom too much because precise techniques and processes have to be mastered in order to achieve predetermined results.

Learning about the history of craft and craft education in the two countries helped me to understand how craft is practised in schools in them. As I did not discuss the history of craft in the literature review chapter, I shall do so now. Sjöberg's model helped me, as a Japanese researcher, to understand the relationships between fine art, traditional craft and fine art in Europe (2009; 72).

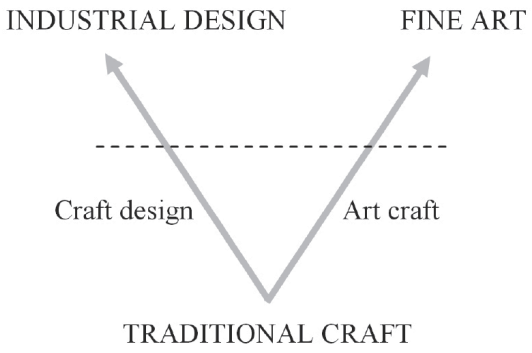


Figure 5. 1 Sjöberg's model of three domains of craft (2009; 72)

Sjöberg's model explains how industrial design and fine art are linked to traditional craft. Industrial design and how fine art originated from traditional craft. Industrial design emphasizes function, service (to a business whose work involves doing something for customers but not producing goods) and technology (scientific knowledge used in practical ways in industry). Fine art emphasises creativity and self-expression. In

between traditional craft and industrial design, and traditional craft and fine art, there are new forms of crafts called ‘craft design’ and ‘art craft’. I found this difficult to understand but recognised there are some crafts that cannot be categorised as traditional crafts, industrial design or fine art. Originally, art and design including skill-based work were not separated. In the nineteenth century Europe, they began to develop their own meanings. The important point of this model for me is that it reveals that in Europe, traditional craft is the origin of both industrial design and fine art. As Walker (1989) pointed out, all kinds of art require different degrees of craft skills and involve problem-solving techniques.

Before the *Meiji* period (1868-1912), when Western concepts of art and craft were translated into Japan, the distinction between art and craft did not exist there either. In the West, since crafts have been understood usually as satisfying functional and utilitarian needs and ‘fine arts’ as dealing with ‘imaginative self-expression and intellectual speculation’ (Mason, et al., 2000; 397, 398). The Japanese term *kogei* sometimes includes painting and sculpture, and was historically the case before the Western notion of ‘art’ was introduced into Japan (Sato, 1996, Kitazawa, 2000). Kitazawa (2000) has written that when Japanese *shukogei* (handicrafts) such as lacquer ware became recognised as ‘Japanese art’ in the West in the 1880s and exported to Western countries, the Japanese government realised that these indigenous works contributed to the Japanese economy. At the time, *kogei* objects had demonstrated skilful ‘applied design’ and the highly skilled making techniques associated with craftsmanship (*gikou-teki-saiku*) (Kitazawa, 2000, Hida, 2006). By the

end of the *Meiji* period, ‘painting’ and ‘sculpture’ gradually established their own identity as fine arts in Japanese society and only *gikou* (craftsmen’s techniques) remained in *kogei*. In the 1920s, the term ‘*kinousei* (function)’ was emphasised in *kogei* and understood as a valuable element in society coming under the influence of mechanization from the West (Hida, 2006). This caused a dilemma. If emphasis was placed on artistic aspects, *kogei* would become ‘fine art’. If it was on function, it would lose its place in art. According to Hida (2006), before the 1880s, *kogei* (craft) meant the same thing as ‘art‘, and they were understood as tools for daily life. He calls this ‘Old Art’ because function and appreciation were unified. At the time, *kogei* was not clearly defined. Reflecting on this history, I consider the concept of *kogei* important because it is linked to a Japanese tradition of art, in which judgements about skilled knowledge and aesthetic value are combined.

Function was a recurring theme in this research. In Japan, making functional objects is a central principle of *kogei* and clearly distinguished from fine art. The teachers in Japan considered ‘function’ as the key characteristic of craft. In England, products made by students in Design & Technology were functional. Function is a key concept in applied arts (the application of aesthetically pleasing decorations to utilitarian and /or industrial products). However, in Japan, the role of function in *kogei* differs inside and out schools. According to Hida (2006), there have been arguments (and movements) about inclusion and exclusion of ‘function’ into forms of *kogei* in fine art since the end of nineteenth century when the Western distinctions between ‘fine art’ and ‘industrial production’ were first introduced in Japan. Idekawa (1997) insists that function is not a necessary

characteristic of *kogei* because many contemporary craft practitioners make craft objects for non-functional reasons. Mizukami (2007) suggests, the term *yoto* (utilitarian) and *kinousei* (function) should be a starting point only for generating and developing ideas for making objects in *kosaku* and *kogei* activities in schools. The students I saw were not making the functional parts of objects in *kogei* projects. They only decorated the surfaces of products. I prefer to use the term 'utilitarian' rather than 'functional' because *kogei* is historically linked to a Japanese tradition of 'art in everyday life'.

This research found that concepts of *kogei* in secondary schools and *kosaku* in primary schools differed slightly. According to *Kojien* (a widely used Japanese dictionary) (Niimura, 2003), *kosaku* originally meant work related to engineering. This research found that *kosaku* referred to making objects while exploring one's own ideas and working with materials and tools. Some Japanese teachers emphasized developing creative ideas while working with materials and tools in *kosaku* but less so in *kogei*. Developing knowledge of materials and tools was the common link and I recognised that skilled knowledge was crucial for them.

5. 3. 2 Possible justifications for craft education in the twenty-first century

Historically, the main rationale for craft education in schools in both countries was training for manual labour for academically less able boys and in domestic skills for girls (Houghton, 2000, Bedford, 2002, Kubouchi, 2004). The status of craft was very low in comparison with other school subjects.

Rationales for craft education have been expanded recently following some evidence

based inquiries: biological (pleasure of making) (Robertson, 1961, Dissanayake, 1988, 1992, Hamamoto, 1992); vocational (Tufnell, 1998, Houghton, 2005); sensory (Robertson, 1961, 1989, Mizui, 1992); psychological (Robertson, 1952, 1961); cultural (Gardner, 1990, Katter, 1995, Mason & Houghton, 2002) and intellectual (Bayns, 1985, Issac, 1986, Hennessay and McCormick, 2002, Eggleston, 2000, Borg, 2001, Owen-Jackson, 2002, Garber, 2002). Classification of these rationales is helpful because it facilitates consideration of a wide range of possibilities for craft education in schools. However, it is important to note I had difficulty reviewing recent theory of craft education. Synthesising findings from the review of literature and empirical research, I identified eight justifications for craft education in schools.

5. 3. 2. 1 Intellectual

This research confirmed that policy makers in both countries were concerned with developing children's creativity at the time of undertaking this research. In the school subject of Design & Technology in England, crafts were justified on the grounds that they provide children with opportunities to solve problems through making (Hennessay and McCormick, 2002, Houghton, 2000, Owen-Jackson, 2002). Some scholars believed that craft can contribute to developing children's higher order thinking (thinking that involves more complex judgemental skills such as problem solving and critical thinking). This occurs when the knowledge people possess and new knowledge is re-organized to create something new. Gardner's theory about bodily kinesthetic intelligence explains the interrelated connection between mind and body. Because craft is widely understood as an activity that does not involve 'thinking', an emphasis on thinking skills in craft

could contribute to increasing its status. However, the teachers in this research in both countries did not mention developing thinking skills as a purpose for craft education. There is a need to educate teachers the relationship of skilled knowledge and cognition.

5. 3. 2. 2 Biological

Teachers in both countries commonly mentioned the importance of students experiencing the enjoyment of making. Anthropologists and art educators argue that that making as a basic human need that is pleasurable and is an important biological drive (Robertson, 1961, Dissanayake, 1988, 1992, Hamamoto, 1992). From my perspective, students in compulsory education should have these opportunities. While experiencing the enjoyment of making and appreciating art (craft) and nature was included as a main aim for art education in Japan, this was not the case in England.

5. 3. 2. 3 Physical

This research found that art teachers in Japan understood craft as important for developing motor skills. Gardner (1990) argues that craft activities contribute to developing bodily kinesthetic intelligence, which is informed by sensory perception and motor actions. How children learn motor skills and how their bodies learn and function has been explored by early child educators and in cognitive psychology. Rogoff (1991), for example, studied how small children learn to refine motor skills in everyday life. Mizui (1992) concerned that lower secondary school students in Japan are no longer skilled at manipulating materials and tools. She pointed out that secondary school students in Japan today do not engage in hand-making actively, so art education has a role to play in developing their senses and dexterity. My previous research (2005) found

that Japanese art teachers felt this was one of the reasons why it is difficult to teach traditional crafts in schools. From my perspective, many activities in real life require motor skills, so students should have opportunities to develop them in schools.

5. 3. 2. 4 Cultural

In both countries, cultural learning is one of the main policy aims. As I did not investigate cultural learning in sufficient depth for the literature review, I consider it here as I discuss the findings. American art educators Ballengee-Morris & Stuhr define heritage as 'what we have inherited from a specific socio-cultural group's history and utilize in our lives' (2001; 7). It is also considered an important part of a person's character. Freedman (2003) writes that the arts are expressions of people's ideas, beliefs and attitudes that illustrate the identities of individuals and groups, while also working to produce them. Learning about the heritage of the cultural group they belong to helps pupils to understand ways people live and construct their cultural and personal identities in other words, the meaning and structure of life. Ballengee-Morris & Stuhr (2001) explain that people within groups change, being influenced by global events and media. Pupils are participants in cultural change and need to prepare for it. The shaping of a sense of identity is linked to cultural heritage transmission and also to participation in cultural life. It is important for children to learn about their cultural heritage and that of other cultural groups in order to construct their own cultural identities.

Cultural policy in the English education system focused on understanding diversity. In England, policy makers expected students to learn crafts from different periods of time and different places, and I saw them being taught this in schools. In Japan, cultural

policy is mainly about learning Japanese culture as the basis for developing international understanding (Iwano, 1999, Sato, 2005). Not surprisingly, I saw traditional Japanese crafts being taught in schools, for example, wood & lacquer crafts. Perhaps, this difference can be explained by the fact that England is a more multicultural society than Japan. Previous research has also established that teachers in England and Wales do not include cultural analysis into craft projects (Mason & Iwano, 1996). As reported in Chapter 4, craft has an important role to play in Japanese schools in perpetuating national culture and history. However, it is not really the case that Japan is a mono cultural society; there are minorities such as *Ainu* people in the north part of Japan and more migrants than ever before. Iwano (1999) points out that Japan needs to establish a new cultural identity that includes the aim of fostering respect for cultural diversity within the nation. Moreover, as long as there is an emphasis on traditional crafts contemporary crafts will not receive much attention. As scholars have pointed out, cultural heritage is not just fixed in the past but relates to the present and should reflect living culture (Ballengee-Morris & Stuhr, 2001). I agree with Katter's idea that craft is a good vehicle for the expression and transmission of group identity, national identity and tradition (1995).

This research identified some teaching of craft history in Japan in relation to traditional crafts. However, a previous study found teachers did not teach craft in context in ways western scholars suggest (Sato, 2005). Teaching arts and crafts within their social context is advocated as a mean of interpreting and translating cultures. As McFee (1995) pointed out, different art forms have had different kinds of impact on society and

each one is connected to a network of supporters, users, critics and subcultures of aesthetic value. For instance, craft has continued to exist in people's home. Each art and craft needs to be understood in its social context and judged accordingly. There is a need for further research about how to teach art and craft in context, especially in non-western countries like Japan.

5. 3. 2. 5 Vocational

This research found that policy makers and teachers in England understood craft education as having a vocational purpose in terms of preparing them for working in 'creative industries'. According to the UK government, the term 'creative industry' refers to a range of sub-sectors of the economy including advertising, architecture, fashion, film and video, software and computer services, and television (UK Trade and Investment, 2007). Bedford's research (2002) confirmed that this kind of vocational ideology underpinned the National Curriculum for Design & Technology in the 1990s. The idea is that students should learn about practical skills for specific employment opportunities in creative industries and improve generic thinking and problem solving skills for any kind of job. I found more emphasis on the latter than the former in this research. The emphasis on developing students' problem solving skills is a way of promoting design thinking skills that might be useful in any kind of job, but conflicts with craft learning that is context oriented.

Tufnell studied the kinds of skills and knowledge employers in England required in potential employees in 1998. The employers he researched were pragmatic and considered practical skills more important than cognitive abilities or personal qualities.

Craft learning could contribute vocationally to a wide range of employment abilities and skills. According to Press and Cusworth (1998), there is an increasing challenge for students to prepare for the skills and knowledge needed in building up new industries. The nature of jobs in society has changed from physical labour to working with new technologies. Craft education could give children the opportunities to prepare for a wide range of future careers.

Despite its successful record of economic and industrial development since World War Two, the Japanese education system as a whole is not vocationally oriented (Howarth, 1991). It is not influenced by industrial needs and industry expects employees to have a good general education background. However, this may be changing in terms of the way industry operates, the economy and modes of employment. In 2006, MEXT identified a need for career education aimed at developing a 'zest for life'. They identified four sets of competences children ought to acquire: namely communication, the ability to use information, plan for the future and decision-making skills. According to Enohara (2007), art education in schools in Japan will probably expand to include vocational purposes, because the economic role of art is more and more recognised in Japanese society.

According to Sennett, craftsmanship refers to 'an enduring, basic human impulse, the desire to do a job well for its own sake' (2008; 9). He points out that this is ignored in industrial societies today. Combining skill, commitment and judgment connects 'mind and body' and 'people and machine', because machines should be used for people's creative work. This is important for human beings physically, psychologically and

socially. Craft education could give children opportunities to understand and develop their craftsmanship through making things better or through quality driven work.

5. 3. 2. 6 Developing domestic skills

This research found that policy makers in Japan emphasised the role of craft education for maintaining the domestic aspects of life such as cooking, making clothes and mending furniture (Home Economics and Technology & Home Economics). In England, very few Design & Technology teachers mentioned this role. The emphasis on the role of craft education in maintaining domestic life in Japan may have originated in girls' education provided in the *Meiji* period. *Saihou-ka* (sewing course) was established in girls' schools in 1878 (Kubouchi, 2004). I consider learning craft skills for use in domestic life important for everyone. Craft as skilled knowledge is useful not only for making aesthetic or industrial objects, but also for mending and maintaining things at home. This was never clearly mentioned as a justification in anly English policy document.

According to Williams, the numbers of craft consumers who are willing to do Do It Yourself (DIY) in England was increasing in 2008. From my experience this is also the case in Japanese society. They do DIY for pleasure and to express their identity, not for economic reasons. This kind of craft is essentially both made and designed by the same person who typically brings skill, knowledge, judgment and passion to their work (Williams, 2008). The DIY industry or economy would be a topic for further research so as to expand justifications for craft education in English and Japanese schools.

5. 3. 2. 7 Lifelong learning

This research found that Japanese policy makers emphasised that art and craft education is for everyday life, in other words, they make life better. According to the national survey research by the Japanese government in 1992, art and craft education contributes to lifelong learning (in Enohara, 2007). Enohara (2007) points out that school art education is important also as preparation for leisure activities.

5. 3. 2. 8 Character development

There is an emphasis in Japanese policy making and in schools in Japan on character development through craft. Through making craft objects, students learn to be patient, take responsibility for all the designing and making processes and to work hard. In England, Robertson also claimed (1961) that craft education is character forming because it teaches children a sense of responsibility and perseverance. In 1952, she (1952) wrote there is real satisfaction in making something well and something that will last, in which each part is skilfully fashioned. My previous research (2005) found that Japanese teachers valued making traditional crafts by hand in schools because students learned 'perseverance', 'how to make an effort' and 'a sense of responsibility'. The concept of *ganbaru* (hard work) is central in Japanese education, and this research found it was an assessment criteria for learning in art. This could be one reason why craft and traditional crafts have not disappeared from Japanese school art education.

5. 3. 3 Successful strategies for teaching design thinking

In this section, I discuss the best way of teaching design thinking in craft education. The policy makers in both England and Japan emphasized teaching and learning creativity

and design thinking in craft. However, the teaching methods for design thinking were much clearer in England than in Japan.

5. 3. 3. 1 Design education

The terms, 'design' and '*dezain'* (design) both refer to industrial products and productions. In England there has been an emphasis on design education since the 1960s. According to MacDonald (1970), the importance of design rules or designs for industry and mass-production increased in society from the late nineteenth century, leading to the introduction of design education in the school curriculum. A need was identified for the notion to produce better quality commercial products in terms of consumer aesthetics and design education could contribute to this. In the present national curriculum in England, design is included in the titles of two school subjects. The latest justifications for design education at the time of the research were that it contributes to creative industries and helps students understand the role of design (Butterworth, 2006). It is clear design education is linked to the development of mechanised mass-production. Similarly, in Japan the government emphasised design education in the early twentieth century in technical colleges (高等専門学校) in order to improve the aesthetic appearance of mass industrial products. Teachers who studied design in Western countries, such as England and France, taught *zuan* (design) in Japan. This western style of design education was introduced in order to improve industrial products and production, made more cheaply by using machines (Fujita, 2008). However, this caused a decline in traditional Japanese arts and crafts learning methods (apprenticeship). In the 1970s, Peter Green's model of design education

focusing on problem solving was introduced to Japanese art educators. However, it was not translated into practice in schools. Fukumoto and Sugiyama (2007) points out that attempts to introduce design education into schools in Japan in the past have failed. In both countries, therefore, design and design education have originated from a need to respond to the development of industrial mass production. One aim of design education in England is to develop students' creativity for their future careers and life. However, the general aims for education in Japan are not vocational, so there is no obvious link between creativity and design education as is the case in England. Japan needs to establish its own aims for design education in the twenty-first century and decide how to implement them based on national needs rather than simply borrow ideas from other countries.

The contribution of design education to fostering students' creativity is that it enables them to 'think and decide by themselves' rather than copy someone else's ideas or ways of solving problems. Lewis (2005) explains that engaging in design activities that have more than one right answer contributes to fostering children's creativity. According to Fautley and Savage (2007) and Mizushima (2009), the recent emphasis on creativity in education in the UK and Japan is more about the 'process' rather than the 'product' and combines both doing and thinking. This educational trend could help improving teaching of design thinking in Japan where it has not been understood very well. One difference between design thinking and creativity is that the former relates to producing a product whereas creativity does not necessarily include this.

This research established that policy makers were emphasising creativity in both countries. Interest in teaching creative thinking skills has increased internationally and not only in art, design and technology education, since the 1980s (Yano, Shibayama, Sun, Nishizawa, Fukuda, 2002). As discussed, developing students' creativity is understood as preparation for a changeable life in society and developing design thinking is useful in everyday life (Noman, 2001, Bayns, 2006). Design as a visual art form, which has a practical outcome, is a way of conceptualizing and visualizing a problem to a solution, and this process is essential to learning in everyday life (Noman, 2001). The literature review found that making plays an important role in developing creativity and design thinking because it is a form of concrete learning. From my perspective, craft as making (action) contributes to creative practical problem solving together with design thinking.

5. 3. 3. 2 Teaching and learning design thinking

As established in the literature review models of the design process have been developed teaching purposes in England (for example, by Kimbell, 1986). Common design stages in the models were: identifying a problem, investigation/ research, specification, creating ideas/ solving the problem and evaluation. They were developed to teach design in Design & Technology in schools and the process had an industrial production basis. The models I observed in England were useful for me as a Japanese researcher and helped me to understand key stages and processes in design thinking.

One model used in English schools was the linear design process model (in Morley, 2002; 15). Although it is criticized for being inflexible or unchangeable, it helps teachers

and students understand key stages in the design process from generating ideas to completing craft objects. Two other models: cyclical design process model (in Fasciato, 2002) and interactive design process model (Kimbell,1986 in Banks, 1994) identified in the literature review were less liner. Those may be useful for teachers to understand more flexible approaches to interactive thinking that the first model does not show.

The concept of design thinking as a process of generating and developing creative ideas was explained more explicitly in policy and practice in England than in Japan. The research in Japan found that design thinking was not taught explicitly in schools, even though policy makers emphasized creativity and creative problem solving. In England, the emphasis was on teaching a 'thinking process' and I saw the process of generating and developing ideas reported in students' sketchbooks. In Japan, the emphasis was on 'products' and the teachers did not encourage developing idea process. Scholars and policy makers in Japan had already pointed out that teaching design was underdeveloped in comparison with teaching making (Ueno, 2001). Some of the ideas about design thinking I found in research in England helped me conceptualise problems in craft education in Japan.

The design stages identified in the literature were observed in schools in England but Japanese teachers interpreted developing ideas differently. In England, at the beginning of projects teachers gave students themes or design briefs. In Japan, teachers gave them projects titles and outlines. The themes or design briefs in England included more detailed requirements than in Japan. In Japanese primary schools the project titles/ themes tended to be rhetorical and open-ended and in secondary schools they were the

names of techniques or objects. It is not surprising that the Japan teachers had difficulty giving students supports to generate their own ideas. Appropriate and familiar contexts, which are not too broad, should be set because students are novice designers (Owen-Jackson, 2002). Themes like identity could be a stimulus starting point.

In England in Art & Design students always researched professional artists and in Design & Technology, they researched existing products and customer needs. This research was carried out using the Internet or books and sometimes when visiting museums and galleries. They were expected to develop their own criteria to evaluate their work. I did not observe individual research in Japanese schools. Instead, teachers gave out instructions and handouts with information on the topic they had chosen (e.g. art history, exemplary work by students). Some students struggled to generate ideas because they relied on this information only or on prior knowledge. This was the same finding as in my previous research (Sato, 2005). Some teachers in England thought individual research was an effective method for helping students to generate and develop design ideas. This could be introduced to Japanese students.

Ideas were generated in the two countries in different ways. I saw more initial ideas in student sketchbooks in England than in Japan. According to Owen-Jackson (2002) and Rutland (2005), the early stage of generating ideas should be creative and divergent with not too much emphasis on checking if they are feasible. Fautley and Savage (2007) mention that regarding divergent thinking generating many different ideas is one of key elements of creativity. The teachers in both countries understood research, discussion and showing exemplary work as the effective methods to generate and

develop ideas. Rutland (2005) also established that a classroom atmosphere, in which students can work without fear of making mistakes, and brainstorming are both important and the Japanese teachers were concerned about this.

As identified in the literature review, 'reflection on their own experience' is an active process and it is important in design thinking (Hennessy and McCormick, 2002, Owen-Jackson, 2002). Reflective practice is supposed to help students solve uncertain problems creatively. Schön (1987) points out that this is crucial for a professional's learning. Reflective practice might help Japanese students to generate and develop creative design ideas.

Experiments with materials and tools were encouraged more in England than in Japan. In Japan, students tried to find out how to use them in the right way by following instructions rather than through experimentation. According to Fautley and Savage (2007), experiments help students develop creative thinking. However, an art teacher in one secondary school in England (EJ) told me there is too much emphasis on experimentation, so he was not able to get students to work carefully and sensitively (14/03/06).

'Self-evaluation' was commonly emphasised in England. In the process of designing and making, students were asked to evaluate their own and each other's work. This evaluation happened not only at the end of projects, but was part of an on-going process (Baynes, 1985, Owen-Jackson, 2002, Newton, 2005). The analytical thinking and critical reasoning that this requires was encouraged, particularly in secondary

schools. In Japan, the *kanso* and *furikaeri* that took place frequently at the end of projects were a form of self-evaluation but were more emotional and subjective than in England.

The use of a sketchbook to record creative thinking was identified in England. Some teachers in Japan asked their students to record lectures, design ideas and *kanso* but without any clear purpose. According to Welch and Barlex (2004), professional designers use sketchbooks for enhancing creativity and students can use them for gathering information when they are looking for creative solutions to a design problem. Using a sketchbook encourages the development of a personal response, individual research skills, autonomous learning and documentation skills (Ash, Hall, Meecham and Montgomery-Whicher, 2000). When I observed all the sketchbooks in use in England I concluded that would be helpful tools for developing students' creative thinking in Japan because they enable them to see and reflect on their work in process.

There are three possible reasons why the process of generating and developing ideas is not taught in Japanese schools: (i) there is more emphasis on teaching traditional crafts and (ii) more emphasis on skilled knowledge and (iii) a lack of understanding of methods for teaching thinking skills. Teaching traditional crafts leads to an emphasis on skilled knowledge rather than design thinking because they require the use of highly specific, skilled techniques. Some of the Japanese teachers considered it important to learn how to use tools and materials because it helps students generate possible solutions to a design problem. However, they were not able to talk about design thinking and skilled knowledge separately. Another reason why there is less emphasis on

teaching thinking skills in Japanese schools may be that the psychological and physical benefits of craft education are considered equally important.

In England, there were differences between the design processes taught in Art & Design and Design & Technology. The approach was more flexible in Art & Design and the problems given by teachers were more open-ended. Design & Technology was more about learning about industrial production that has specific stages and processes to produce functional products effectively. Lewis (2005) claims that a problem for the field of Technology education in the UK is the over-description of stages in the design process. This simplifies how people design, which is in reality a much more complicated, intuitive process. Design processes taught in schools in England tend to be described by a predefined formula. For example, the design processes in GCSE sketchbooks I saw were more or less same. More flexible processes should be encouraged. However, I understand that a student as a novice designer needs to understand the essential processes of design. In Japan, the design process was not flexible because students were asked to produce a final design idea at the beginning of each project. This did not allow students to develop their design thinking because they cannot change direction once they start and there is no interaction between re-thinking and doing (making things). Probably, more flexible processes would allow students in Japan to generate and develop design ideas because designers think more subconsciously and interactively.

5. 3. 4 Apprenticeship

Historically, apprenticeship has been understood as a traditional form of teaching and

learning and is the most important mode of craft education in many cultures (Coy, 1989, Ikuta, 1987, Gardner, 1990, Dormer, 1997, Ikeuchi, 2000). For example, in Japan it is visible in the studios of craftspeople who have made Buddha's statues since the fourteenth century. Novices learn to make traditional instruments such as *shamisen* and traditional dances such as *nihonbuyo* continue to learn in this way today (Ikuta, 1987, Ikeuchi, 2000). In Europe, every artist and craftsperson learned through apprenticeship until the Renaissance (Sennett, 2008). Although it largely disappeared in England after the industrial revolution and introduction and development of formal schooling, the apprenticeship model of training is still evident in some elements of the business sector today. A National Apprenticeship Service (NAS) was officially launched in England in April 2009 to help more employers take on apprentices and train them in the traditional way and to ensure more young people and adults are able to benefit from the experience of work-based learning.

5. 3. 4. 1 The apprenticeship model in schools

After examining literature about craft in cognitive psychology and anthropology, I identified seven key characteristics of the apprenticeship learning model that merited further examination when I was interpreting the data from the observations and teacher interviews in this research. They were: (i) tacit learning (non-verbal communication); (ii) the novice-expert relationship; (iii) the importance of demonstration and observation (imitation); (iv) getting inside a craft culture and a community and (v) that it is a slow form of learning that takes a long time; (vi) the idea that apprenticeship results in positive attitudes towards work' and (ix) 'the importance of authentic resources for craft

learning'. There was evidence of some but not all of these characteristics of the apprenticeship model being implemented in craft education in the schools I researched. They are highlighted and discussed now. Through this discussion I try to come to a conclusion as to whether or not this model is appropriate for schools. These seven characteristics are discussed in detail in the next section.

5. 3. 4. 2 Tacit learning

Tacit learning was evident in both countries when I saw teachers showing exemplary work and successful practice to students in craft lessons, rather than giving lectures or asking them to read books. I also saw some students observing how other more skilled students were making things. This dimension of the apprenticeship model was central to the way craft was taught in the schools. Tacit learning does not simply imply non-verbal communication. According to DeCoker (1998) and Sennett (2008), oral communication can work as metaphor. DeCoker's research found that a calligraphy teacher admitted to facing difficulties in describing exemplary work in words and said she had to rely on the use of metaphors from nature. This aspect of the apprenticeship model would be an interesting topic to investigate further. However, it is difficult to study because it cannot be articulated fully in words.

5. 3. 4. 3 Demonstration and observation

This research found that teachers in both countries understood teacher demonstration and peer teaching as effective strategies for learning craft skills. The teachers I observed demonstrated to the whole class, groups and individuals. I witnessed students teaching each other also and looking at the most skilful students' work (skilled students

taught the less skilled ones). Demonstration by a skilled to a less skilled person is a key characteristic of the apprenticeship model of learning (Coy, 1989, Rogoff, 1990, Lave and Wenger, 1991, DeCoker, 1998, Sennett, 2008). Coy (1989) explains that in apprenticeship, a novice learns from an expert through observation and practice. Previous research in England and Japan has confirmed that this is the best way of learning a craft in schools (Houghton, 2000, Sato, 2005). However In traditional apprenticeships in artisan workshops, apprentices observe others at work rather than being taught explicitly. The demonstrations to students by teachers I observed in schools were more structured than this. However, I understood demonstration by skilled people and observation as fundamental to most people's understanding of craft education in schools in England and Japan. Moreover, the teachers and students in both countries liked this mode of teaching and learning.

In the same way as in the model, the teachers in this research considered practising techniques as crucial for developing skilled knowledge. Hida (2006) writes that *kogei* is 'experience' gained through repetition and training and learning specific craft techniques was central to craft projects in both countries. In England examples of skill focused projects were included in the curriculum support documents for Design & Technology and the teachers gave students in Japan opportunities to practice skills again and again throughout their schooling. Because of the emphasis on experimenting with materials in England, I wondered how, where and when students practiced techniques. This differs from the apprenticeship model as applied in schools in Japan.

One argument against focusing too much on technique is that learners merely copy

expert practice without thinking. Through my experience as a practitioner and researcher of craft education, I have come to realise that ‘imitation’ is not a simple matter. Novices who try to make things like experts soon realise how little they understand at first. They get help from the expert and try again and again until they get something right. According to Ikuta (1989), *moho* (copying forms) during apprenticeship is about imitating successful actions and understanding the aesthetic qualities of expert work. One problem she pointed out is that students try to complete exercises in school too quickly without understanding the meaning and quality of their work. For instance, in Japanese lessons, students are expected to learn poems by heart but do not understand their meaning. She claims that the concept of *moho* is misunderstood in contemporary schooling, when people dismiss it as having nothing to do with autonomous learning or individual creativity. It is clear that imitation is crucial for anyone who wishes to acquire a craft skill. To conclude, more research is needed into ‘imitation’, its role in craft learning, and how this contributes to developing skilled knowledge. This aspect of the apprenticeship model was evident more in the Japanese than in English schools.

5. 3. 4. 4 Expert roles

This research confirmed that skilled people are essential for craft teaching in schools. Teachers in both countries admitted they could not teach students how to make things unless they knew how to do it themselves. This is the case with all crafts and arts activities, including painting. Although in the apprenticeship model outside school the teacher is always an expert craftsman it was rare for the teachers in the schools in this

research to have expert craft skills. For instance, only two art teachers in England had expert textile skills. Some crafts require knowledge of specific skills and techniques that take a long time to learn and some teachers in this research considered inviting craft professionals to show their work in lessons a sustainable learning strategy. I think it is important teachers and expert craftspeople work together, though this is not the same thing as what happens in the traditional model of apprenticeship training. Some teachers in England complained that although professional craftspeople are experienced at demonstrating what they do, they have poor teaching skills. So this strategy is problematic. Other teachers only valued having craftspeople in school because they functioned as a role model for craft as a possible future career. Japanese teachers also mentioned that professional craftspeople do not understand young children's individual needs in the same way as teachers. According to Wood (2004), craft practitioners without teaching experience are not able to communicate their tacit knowledge to students in schools and once learners gain basic craft skills, they develop and adapt them to suit their own needs. At this early stage of craft learning, however the ability of learners to adapt and innovate depends on the flexibility of the craftspeople they work with. This aspect of the apprenticeship model was missing in the schools in this research because, the teachers were required to develop the skills needed to teach children in general rather than expert craft skills.

According to Rogoff (1990), 'shared problem solving' is central to the process of learning through any form of apprenticeship, not just craft. Skilled partners help children experiencing difficulty, by structuring problem solving sub-goals to focus their attention

on manageable aspects of a given task. According to Schön (1983), true reflective practice always requires another person, in the form of a mentor, who asks appropriate questions to ensure that the reflection goes somewhere and does not get bogged down in self-judgement. These theories are confirmation that it is important teachers in craft lessons in schools have good craft skills. In this research, one Japanese art teacher told me that he sets appropriate goals, or problems, by considering the level of his students' craft skills. As some scholars point out, expert roles are particularly important in the early stages of craft learning when novices cannot adapt their own practice. Wood (2004) explains that experts need to modify their explanations and demonstrations when novices experience difficulty, so they can solve problems. Similarly, Schön (1983) mentioned that reflective practitioners who are experts typically modify their teaching by reflecting on/in it in their on-going lessons. Teachers in schools need skills to be able to explain their craft knowledge in an understandable way as well as to demonstrate craft skills.

5. 3. 4. 5 Getting into communities and cultures

This research found no evidence of learners participating in communities of craftspeople (Rogoff, 1990, Lave and Wenger, 1991, Sennett, 2008) or of 'informal unstructured craft learning' in school contexts. Craft learning in schools was more formal and structured. The culture of a craft class in school is not the same as that of a craft workshop outside school. The purposes, contents, procedure (time schedule) and assessment methods and criteria for craft learning in all the craft lessons I saw were planned by the teachers, the schools and educational policy makers in advance. For

example, when Japanese students learn carving techniques they always begin with the basic ones, following step-by-step, how-to-do-it instructions, and move to more complicated ones. Craft projects in schools were conducted one or twice a year and their content was planned by the teacher and school. In a craftsman's workshop, this kind of structured learning and curriculum does not exist. Ethnographic research is needed to inquire into the culture of craft education in schools in more depth so more comparisons like this can be made.

Lave and Wenger (1991) understand the apprenticeship model of learning in a craftsman's workshop as one example of what they call 'situated learning' because it emphasises that novices learn from experts by 'getting into' a specific cultural community. They assert that situated learning is not really an 'educational form', much less a pedagogical strategy' when it takes place in cultural contexts outside schools, for example, in a tailor's workshop (1991: 40). In medieval times in Europe, and in Japan today craftspeople (novices) live with *shisho* (experts) for extended periods of time and look after them (Ikuta, 1983). This implies that they are expected to learn a cultural value system holistically. There are important questions for craft education in schools surrounding this issue. Does formal schooling really have anything to do with learning a craft? Do craft practices in schools comply with Lave and Wenger's principles of 'situated learning' if they do not use the authentic equipment, materials and tools that craftspeople use in society? This aspect of the apprenticeship model of learning is the most difficult to adapt to formal schooling. To conclude, it is clear that craft classes in schools do not practise this aspect of the apprenticeship model, and it is difficult to

adapt it to craft lessons in schools.

5. 3. 4. 6 Slow learning

The apprenticeship model of learning in its proper form is too time consuming for schools. All the teachers I studied complained there was not enough time in craft lessons. Some students told me they had much more time for making at home than at school and liked this better. Research by Houghton (2000) in England also found that students in secondary schools complained that there was not enough time to make things. This may be one reason why craft is disappearing in English schools. I discovered that students in some Japanese schools went to the art room to do their work in the early morning and after school when they had finished their other lessons. In the Japanese primary schools I visited, art rooms were always open to students. It appears that school schedules are not as supportive of craft learning as apprenticeship schemes are in society. Therefore, it is difficult to adapt this aspect of the apprenticeship model of learning to schools.

5. 3. 4. 7 Attitudes to work

Discipline and enduring hardship and the ideology of art as a spiritual quest are two other characteristics of the apprenticeship model as understood in Japan. The Japanese teachers in this research expected their students to work hard (*ganbaru*). In England, teachers were more relaxed and less demanding. According to DeCoker (1998), Japanese arts teachers who discipline their students understand endurance and bodily and mental hardship as a means for promoting personal growth. Until I did this research, I thought *ganbaru* was a core concept in learning in every culture. I

understand it as compatible with Sennett's theory of craftsmanship, which refers to it as an attitude of valuing hard work for its own sake (2008). DeCoker (1998) suggested that the goal of traditional Japanese arts, such as *shodo* (calligraphy) or *kado* (flower arranging) is mastery of the self rather than the art form. Similarly, a western art educator, Mason (2000), was surprised by the way that students in Japanese schools were expected to learn by working hard and disciplining themselves for self-realisation. This could be one reason why craft education in schools is promoted in general education policy in Japan and is closer to the traditional apprenticeship model in practice than is the case in England.

5. 3. 4. 8 Insufficient resources

The research identified poor levels of internal and external resourcing for craft in schools in both countries, for example, lack of equipment, materials and tools and limited use of museums and craftspeople. The literature emphasized that learning in a real world setting is crucial in the apprenticeship model and that craft lessons should involve authentic materials, tools and craftspeople. The primary schools in England did not have art rooms and were poorly equipped in comparison to Japan. However, the English secondary schools I visited were better equipped. Many teachers told me that authentic craft materials are too expensive for schools. These findings are supported by previous research (Bedford, 2002). This makes implementing the model difficult.

Some Japanese secondary schools I visited used commercial kits for traditional crafts projects and survey research carried out in 1989, found that the majority of teachers used them frequently (cited in Mizui, 1992). In my previous research, after considering

safety issues and expense, I concluded that commercial kits are helpful because they offer students opportunities to gain at least some experience of making traditional crafts. However, as Sennett (2008) points out, the use of authentic materials and tools is considered crucial in the apprenticeship model. Therefore, students should use them in schools. They are not adhering to the model if they do not do this.

5. 3. 4. 9 Is the apprenticeship model of learning craft appropriate for schools?

Robertson (1952) considers it inappropriate because of the absence of experts and the numbers of students of the same age in one class. On the other hand, some scholars argue for the use of an apprenticeship model in schools for other subjects (e.g. writing, reading and mathematics) (Ikuta, 1987, Collins, Brown and Holum, 1989) and maintained traditional apprenticeship models for use in the school settings. In this research, tacit learning, demonstration and observation and attitudes to work were evident in craft lessons in schools. Expert roles were not evident but adapted to the school context by requiring not only craft skills of teachers but also general teaching skills. Slow learning and the use of authentic resources are particularly difficult to implement, as the teachers pointed out. Students cannot 'get inside' a craft community or culture in a school and the school craft culture is not the same as that of a craftsman's workshop outside school where teaching is unstructured and informal. There are many obstacles to implementing the model fully in schools. Working with craftspeople, improving teachers' craft skills, providing more time for lessons and using authentic materials and tools are essential for the model to succeed in Japanese schools. However, tacit learning, demonstration and observation and attitude to work

which are key characteristics of the apprenticeship learning model are practised, particularly in Japanese schools where they are understood to be 'the best' way of learning craft. In conclusion, only some aspects of the apprenticeship model of learning are relevant to teaching craft in schools.

5. 3. 5 Aesthetic judgement and school based crafts

Through investigating craft education in the two countries, I gradually came to realise the importance of the aesthetic value, in the sense of making objects skilfully and well, in sustaining craft cultures. As I was not aware of this at the beginning of the research, I had to read theories relating to aesthetic judgement during the data analysis and discuss the findings now. According to Hickman (2005), aesthetics is mainly concerned with understanding the nature of beauty. According to Mason and Houghton (2002), in craft education aesthetic judgements about the manipulation of materials and processes are important and judgement about making operate within a specific discipline base. It was important to understand how teachers make judgements about students' craftwork in each country and what factors influenced them.

The English and Japanese policy makers promoted different approaches to art criticism and response. In England, critical thinking skills were considered an important and analysing and evaluating artefacts or products critically was emphasized in the assessment policy and practice. According to Hickman in 2005, critical thinking had a secure place in the art curriculum, where it was more integrated into making than ever before. Because analysing, synthesising and evaluating objects and art works and information from observation, reasoning and reflection are crucial elements in design

thinking, this helps to promote more critical thinking in craft projects.

In Japan, art policy is directed more towards assessing the quality of students' subjective and emotional responses arising from experiencing artworks and nature. Policy statements about critical thinking lack clarity in comparison with England, but it is important to try to understand them. In art appreciation, students are expected to feel and understand the beauty of artworks and nature rather than analyse and evaluate them. This idea of experiencing the pleasure of art appears similar to the German philosopher Immanuel Kant's theory of beauty. Kant believed that judgements of beauty are universal and grounded in the real world, even though they are not essentially objective (Freeland, 2001). Beautiful objects do not always have a human purpose but, for example, beautiful roses please people. This fits the Japanese aesthetic emphasis on enjoyment and appreciation of art and making. However, no judgemental activity is included. Therefore, there is little opportunity for Japanese students to express ideas about art verbally, explain why they like or do not like it and develop verbal evaluation skills. From my perspective, this discourages the kind of design thinking that requires them to make judgements about their own and each other's work that helps to develop creative ideas. On the other hand, it does motivate making. The emphasis on the enjoyment and pleasure of making in Japanese policy and practice is an important contribution to the theory and practice of art and craft education in schools. It is supported by anthropological theory explaining that craft is pleasurable and is a critically important basic human biological need (Dissanayake, 1988).

This research found that craft teachers in Japan assessed the quality of end products

more than in England, even though teachers in both countries told me that they emphasised processes. Secondary school students in England were required to record their designing and making processes and include individual research and evaluation in sketchbooks. This was understood to be as crucial in the developing creative thinking for the national exams. In, Japan, some teachers asked students to keep notebooks or sketchbooks but they used them to assess effort and art appreciation skills but not thinking processes. Clearly, thinking processes are assessed more in England than in Japan.

I did not see as many well-made craft objects (technically) as expected in schools in either country. I questioned whether craft, understood as skilled knowledge, actually existed in schools. This may not be the case given that students are novices in terms of acquiring skilled knowledge and have not reached the level of excellence required in the apprenticeship model. However, they did acquire some skilled knowledge by copying exemplary work and exploring and experimenting with materials and tools. I gained the impression that students in Japan worked more carefully, and paid more attention to techniques than in England, where there was more experimentation with materials and tools. In Japan, technique and working carefully were important criteria for making good craftwork. The explanation for this could be cultural. According to Hida (2006), Japanese culture in general tends to require a high quality of '*fuai*' (appearance and sense of touch) and '*shiage* (finish)*'* understood as a kind of Japanese indigenous spirit. This is evident in both old and new Japanese forms of making such as *teshigoto* (handwork) and *monozukuri* (making things including industrial production). Skilful

making in schools may be influenced by aesthetic values outside of school.

While assessment methods and criteria were standardised nationally by the government in England, in Japan they relied on each school and teacher. As discussed, craft learning is informal and unstructured (Ikuta, 1987). In my view, under a standardised examination system, this kind of learning is not practical because it relies on tacit learning and is too time-consuming. In the case of Japan, there is no such examination system. However, paper tests designed by each art teacher were used as one way to assess students' understanding of crafts knowledge. However, this system cannot adequately assess both design thinking and skilled knowledge together.

CHAPTER 6
CONCLUSIONS AND IMPLICATIONS

6. 1 Introduction

In the first part of this chapter I attempt to answer the research questions. In the second part, I reflect on the research method. Also, I spell out the implications of this study for craft education theory and practice for international audiences of art educators, and then for policy makers and practitioners in England and Japan. I conclude this thesis with some personal thoughts about how the research has affected, and will change, my own practice as an art teacher, artist and researcher.

6. 2 Conclusions

The research questions as stated originally were:

1. How is craft conceptualised in Japanese and English educational policy and practice?
2. Which methods do Japanese and British art teachers use to develop creative design ideas and craft skills and techniques? How are they similar and different?
3. Is a skills-based craft curriculum compatible with developing individual design ideas?
4. How are or should these learning domains be combined, if it is possible?
5. Is there anything that Japanese art educators can learn from recent developments in craft education in England?

6. 2. 1 Concepts of craft

At the beginning of this research, craft was tentatively defined as *knowledge of how to create objects skilfully and well through the manipulation and control of materials, tools and equipment and processes*. It was hard to arrive at a definitive concept of craft education in such a small-scale research. Therefore, I report and discuss my findings

about how craft, *kogei* and *kosaku* were understood in the research contexts.

This research confirmed that in both English and Japanese schools, 'skilled knowledge' is understood as central to making in craft education. However, there were some differences between the two countries. In England, craft, understood as skilled knowledge, was not explicitly included into policy, and craft is not distinguished from art and design. Instead, it was understood as a part of them. When I saw skilled knowledge being taught and explored in England it was at a very basic level, in which students were experimenting with materials and tools. In art lessons in English schools, developing original ideas was always emphasized over and above skilled knowledge. Additionally, I did not see teachers and students affording much aesthetic value to making things skilfully and beautifully. Therefore, craft in England, as interpreted in this research context, is defined as *the practical knowledge students need to design and make objects when they generate original ideas and explore and experiment with materials and processes.*

Regarding skilled knowledge in craft education (*kogei*) in Japan, I found that students were expected to make functional and utilitarian objects both for aesthetic and utilitarian reasons. The term 'beautiful' was used frequently to refer to technically well-made objects and was closely linked to my idea of skilled knowledge. Japanese students were expected to acquire more skilled knowledge than English students, for example, to use materials and tools in the correct way rather than just experiment. The concern with making objects for use in everyday life is consistent with the theory of indigenous Japanese art, which does not distinguish craft from fine art. *Kogei* was taught in a way

that emphasises Japanese cultural heritage and traditional craft skills and contemporary artist crafts (non-functional) were not included in school curricula. According to Japanese policy, function is an essential element of *kogei*. However, when I observed *kogei* lessons in schools, it was not always the main consideration. I prefer to use the term 'utilitarian' rather than 'functional', because *kogei* is historically linked to a Japanese tradition of 'art in everyday life'. I defined *kogei,* as understood in this research context, as *the practical knowledge students need to design and make objects for use in everyday life beautifully and well technically when they manipulate materials, tools, equipment and processes.*

In Japan, the term *kogei* was used for craft in secondary schools and craft was called *kosaku* in primary schools. In *kosaku*, students were expected to make objects for expressive and aesthetic purposes and explore materials and tools by themselves. This was more like craft in England. There was a strong emphasis on the finished product. In *kosaku*, the emphasis was on learning basic techniques and skills, exploring materials and learning how to use tools. Therefore, I defined *kosaku* in this research as *the practical knowledge that students need to make objects when they generate and develop their own ideas and explore and learn to control materials, tools, equipment and processes.*

Although craft, *kogei* and *kosaku* all refer to skilled knowledge, they were interpreted differently. I consider the concept of 'craft' in England too close to 'fine art', and this explains why its identity has become so uncertain. In terms of skilled knowledge, *kogei* was closest to the definition of craft originally created for the research but it excluded

non-functional contemporary artist crafts. The learning domain called *kosaku* allowed for teaching both design thinking and skilled knowledge and attempted to combine them. However, it was only taught at primary school level.

Policy and practice for *kogei* and *kosaku* were not well connected, although both subjects have played an important role in promoting skilled knowledge and transmitting cultural heritage. As previously explained, each has its own rationale for inclusion in school curricula. *Kogei* emphasizes traditional crafts more than *kosaku* and *kosaku* emphasizes developing design ideas more. This should be explained in more detail in the policy documents, together with ways of linking them. Otherwise skilled knowledge will not develop adequately or effectively from the beginning to the end of Japanese compulsory schooling.

6. 2. 2 Teaching methods

In England, the main aims of art education were to develop students' critical thinking skills and creativity. Not surprisingly, this influenced the way craft education was taught. In actual fact, learning design thinking was one of the most important objectives for craft education in England, and design processes and stages were clearly specified in curricula. Craft projects were initiated with 'themes' in Art & Design and 'design briefs' in Design & Technology that included detailed requirements for making named products. In England, key stages in teaching design processes were specified, and individual research and self-evaluation were strongly emphasised in policy and practice. In Art & Design, students were expected to research artists and their work by themselves and in Design & Technology to research products and consumer needs using the Internet,

books, surveys or visits to museums galleries and shops. Students were expected to evaluate their own work using criteria they had developed themselves during the project. They used sketchbooks as a tool to develop their creative thinking and record their own design processes, including individual research, reflections on processes and self-evaluations. Students in Design & Technology, in particular, used them to record design processes and communicate design ideas. I observed teachers' showing exemplary work made by craftspeople in lessons and some teachers understood this as the most effective way of teaching design thinking. Teachers also suggested themes for discussion and asked students questions about them.

Japanese art education policy emphasised developing creativity and creative problem solving together with making skills, but did not explore how to translate this into practice. At the beginning of each project, teachers gave students project titles and outlines that included aims and procedures. The titles were open-ended and 'imaginative' at primary school level and focused more on techniques or products at secondary school. The handouts used at secondary school level included historical information about craft traditions, objects, materials and techniques and design and making procedures. Teachers gave short lectures at the beginning of projects and showed exemplary work by professional craftspeople. Students were asked to draw their final product before they started making it, particularly at secondary school level. At primary school level, they were expected to generate and develop ideas through making. Teachers at both levels frequently showed exemplary work by students in lessons, to help stimulate ideas. Writing *kanso* took place at the end of each project. Students were asked to write *kanso* or describe their feelings about their work in notebooks or sketchbooks at the end of

some lessons.

In both countries, design thinking was included as an aim of craft education, implicitly or explicitly. However, there was more information about this in England than Japan. In Japan, designing and making processes were more rigid. The key stages in the design process, as taught in England, were either not spelled out or were taught differently. Also the stimulus themes and design briefs used as starting points in England were more detailed than in Japan. The kind of individual research promoted in England was not encouraged in Japan. Instead, the necessary information was given to students in lecture form or handouts. Whereas students in both countries were expected to reflect on and evaluate their work by themselves, evidence of critical thinking and reasoning was required in England but not in Japan.

In England, making as a synonym of skilled knowledge was central to both Art & Design and Design & Technology. The demonstrations by teachers of skilful craft techniques that happened in lessons in both countries confirmed that they are an effective method for teaching craft. Technique focused projects were commonplace. Teachers showed photos of work by craftspeople and samples of students' work in class to exemplify the correct ways of using materials and techniques. At secondary school level, individual research into techniques and materials was reported in sketchbooks. Students were encouraged to experiment with materials and processes. Some teachers created their own 'how to make' instruction sheets or purchased them from commercial suppliers for use in the classroom.

In Japan, there was an assessment criterion for skilled knowledge, which identifies

competency in manipulating materials, tools, equipment and processes. According to the teachers, demonstration of techniques and processes and observation were understood to be the most effective way of teaching this. Students observed and asked questions about making not only of teachers, but also of skilled peers. They were given handouts about technical processes consisting of written text, drawings and photographs in secondary schools. Posters with instructions about techniques and how to use tools, materials and equipment were evident in classrooms. The Japanese teachers understood teaching skilled knowledge as important alongside developing original ideas. They taught making skills sequentially from simple to complex, so students could accumulate them and improve over time. Craft projects lasted between three and nine months, which was considerably longer than in England.

6. 2. 3 The influence of subject domains on craft education

This research identified that school subjects and learning domains influence how teachers understand craft and how design thinking and skilled knowledge are taught in both countries. It is important to examine them so as to arrive at conclusions about the best way of teaching and learning craft. According to Csikszentmihalyi (1999), creativity cannot be studied without addressing the parameters of the cultural symbol system in which the creative activities take place and the social roles and norms that regulate them. In empirical contexts, each creative domain, such as in art or music, has a different value system. In the case of this research, one parameter is the definitions of the school subjects. These were Art & Design and Design & Technology in England and Art & Handicraft, Art, Home Economics and Technology & Home Economics in Japan.

In England, learning domains for the National Curriculum programme of study for Art & Design were: (i) ‘Exploring and developing ideas’; (ii) ‘Investigating and making art, craft and design’; (iii) ‘Evaluating and developing work’ and (iv) ‘Developing knowledge and understanding’ (Figure 6. 1). As discussed in Chapter 5, the strong emphasis was on creative thinking skills and this is relevant to design thinking. However, it was not clear if the term ‘making’ used in the curriculum was equated with skilled knowledge or not. Similarly, the programme of study for Design & Technology included: (i) ‘Developing, planning & communicating ideas’; (ii) ‘Working with tools, equipment, materials & components to make quality products’; (iii) ‘evaluating processes & products’ and (iv) ‘Knowledge & understanding of materials & components’ (Figure 6. 2). As mentioned in Chapter 3, this subject domain included both design thinking and skilled knowledge and the latter was emphasised more than in Art & Design. The way the subject domains were structured in policy clearly influenced how craft was taught in the English schools.

The learning domains in the Courses of Study for Home Economics and Technology & Home Economics in Japan were organised around the fundamental needs for living. The Course of Study for Technology & Home Economics was divided into ‘Technology’ including ‘Technology & making things’ and ‘Information & computers’ and ‘Home Economics’, including ‘Independent living and food, clothing & sheltering’ and ‘Family and family life’ (Figure 6. 3). These linked to the idea of making things for use in everyday life, which was emphasised in *kogei* and *kosaku*. However, this curriculum did not specify design thinking in detail.

The Courses of Study for Art & Handicraft and Art had two main learning domains:

Hyogen (making) and Art appreciation. As mentioned in Chapter 4, *kosaku* and *kogei* were part of *Hyogen* in these documents. These curricula were not structured around any thinking skills relevant to creativity or design thinking, unlike the English curricula. With reference to Sjöberg's three domains of craft (2009) described in Chapter 5, the Japanese curriculum for Art covered art and craft while the English curriculum for Art & Design covered art and design. I concluded that this ambiguity in the way thinking skills are referred to in the subject domains may be one of the reasons why design thinking was not taught much in craft lessons in Japanese schools.

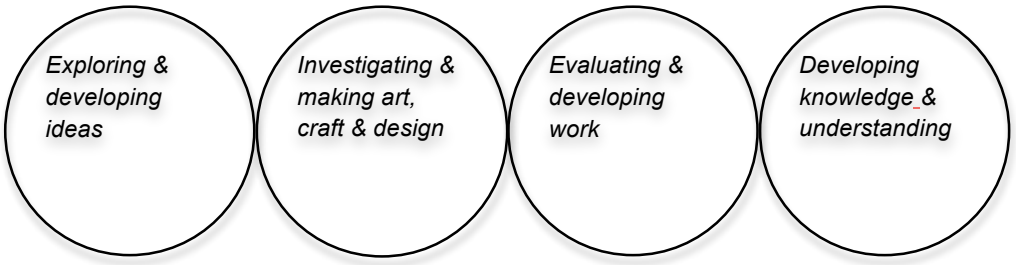


Figure 6. 1 Learning domains: Art & Design

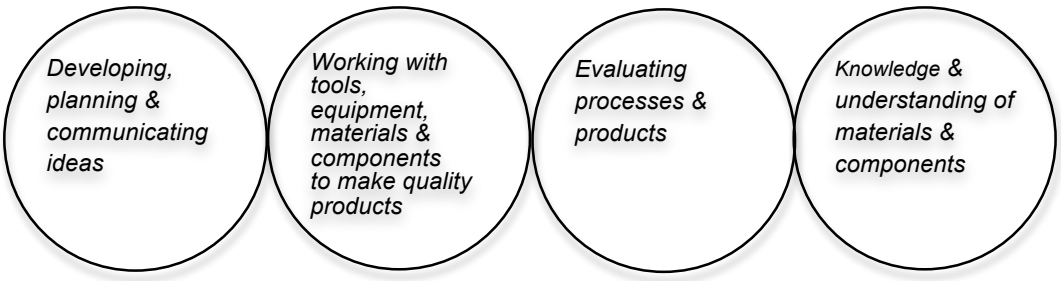


Figure 6. 2 Learning domains: Design & Technology

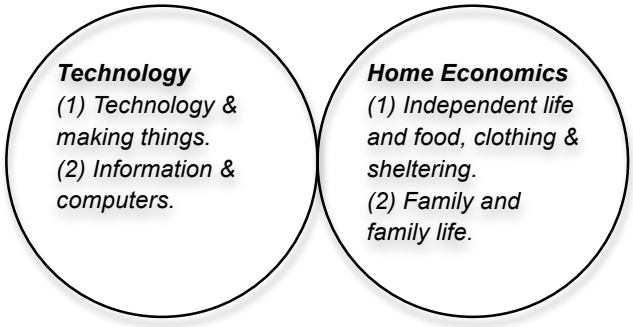


Figure 6. 3 Learning domains: Technology and Home Economics

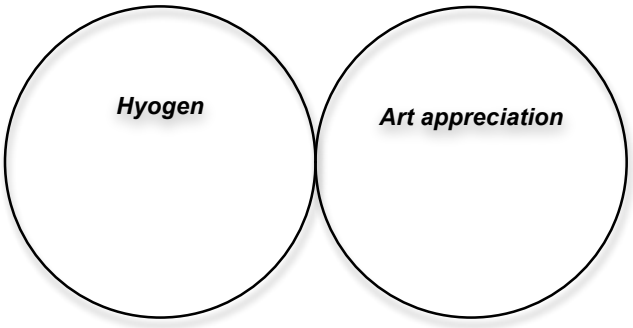


Figure 6. 4 Learning domains: Art & Handicraft and Art

6. 2. 4 Introducing design thinking into skills-based craft curricula

This research confirmed it is possible to teach design thinking in a skills based craft curriculum. As Pye (1968) and Sennett (2008) insist, skilled knowledge should not be taught for its own sake but in order to solve new problems or produce better work. Many professional crafts people use their competence in manipulating materials and tools in order to create unique objects. For example, potters attempt to create new colours manipulating the glazing skills they possess already. However, it is difficult to teach both design thinking and skilled knowledge together in school craft projects. The key problem is that when the emphasis is on design thinking, the end product becomes less important. When teachers encourage students to try out new ideas, they may not be able to complete products because they do not have enough knowledge of making to realise their ideas. Most importantly, the apprenticeship model of learning that the specialist literature identifies as fundamental to craft education is not really compatible with formal schooling for reasons already discussed (Chapter 5).

6. 2. 5 Possible ways of teaching skilled knowledge and design thinking

All the cases of craft projects studied in this research emphasised either design thinking or skilled knowledge, so I concluded it is possible to teach them together. A recommendation would be that teachers always include both in their project aims and

assessment criteria. The aims the teachers in this research proposed influenced what, and how they taught and most teachers took them seriously. Another recommendation is that teachers plan curricula so that students accumulate skilled knowledge and design thinking skills sequentially throughout their primary and secondary schooling, because they take a long time to develop. For this reason, one Japanese primary school teacher I interviewed taught skilled knowledge and design thinking together from Years 3 to 6. A third recommendation is that teachers consider the best way of balancing the teaching of design thinking and skilled knowledge when they plan curricula and projects. Some Japanese teachers told me they set open-ended themes for projects that aimed to develop design skills students already knew and well defined themes for projects focusing on developing specific making skills. A fourth recommendation is that not only summative, but also formative assessment is used to help students reflect on their work throughout the designing and making processes. Both design thinking and skilled knowledge are learned most effectively when skilled people give thoughtful comments on novices/ students' work and ask appropriate questions. Their support is important for students so they can use the skilled knowledge they already have to solve practical problems.

6. 2. 6 Lessons from England

In this section, I discuss what Japanese art educators might learn from recent developments in craft education in England. At the end of this research I conclude that Japan ought to expand the traditional justification for craft education, such as character formation, development of motor skills and learning cultural heritage. Developing thinking skills is another justification, because design thinking is crucial in craft activities.

This research established that contemporary non-functional artist crafts and design crafts were being taught in England but not in Japan. As discussed in Chapter 5, fine art and industrial design have their origins in craft. The review of literature established that the term ‘cultural heritage’ not only refers to culture in the past but also in the present. Culture is not static and is changed by people all the time.

In England, the emphasis on teaching thinking skills has led to prioritising the teaching of design in craft projects and more varied strategies for teaching design thinking were described and in use there. The emphasis on divergent thinking, critical reasoning and flexible design thinking processes is especially interesting for Japan. Students of craft are essentially novice designers who need to understand the stages in the design process from beginning to end. Japanese policy and teachers need to introduce and teach these stages.

One lesson Japan can learn from England about teaching skilled knowledge is how to use professional craftspeople in schools. When professional crafts people demonstrate and show their work, students have the opportunity to understand how to make objects better and to appreciate their work. Also, students are able to consider practising a craft as a possible future career choice. Moreover, teachers can develop their craft skills when they work alongside a craftsperson. As described in Chapter 3, some primary school teachers in England told me they learned new techniques from crafts people.

This research found a strong emphasis on creative thinking skills and a lack of reference to skilled knowledge in recent policy, and this had been accompanied by a decline in craft education. Therefore, I strongly believe that *kogei* and *kosaku* should remain as specific learning domains in Japan.

6. 3 Reflection on method

In this section of the chapter, I reflect on the research method, acknowledge some of its strengths and limitations and examine how it influenced the outcomes.

6. 3. 1 Cross-national comparative research

Conducting cross-national comparative research broadened my understanding of craft education better in Japan. Moreover, comparing the findings and identifying similarities and differences in the two countries enabled me to conceptualise problems in craft education in Japan. One of the main difficulties I experienced in doing a cross-national comparison was my unrealistically high-expectation of English craft education at the start. Another was that I neglected to consider the positive aspects of craft education in Japan. I understand that comparative research, as a methodology, helps researchers to understand other cultures better and to find possible solutions to problems in their own education system. It is not to decide which system is best or worst.

6. 3. 2 Researcher's reflections on process

Since this was a qualitative study, it is important to reflect on this process in order to tackle the issue of reliability. The research was closely connected to my personal cultural identity and interests, so I reflected upon my actions and values continuously when I walked to and from the library, for example, and did other everyday activities. However, at the beginning I was not good at keeping records of my reflections. I used one notebook for my reflections, tutorial records and to record references of books, but I did not understand how to carry out reflection for a long time. I gradually learned how to question myself and my ideas, and this enabled me to think more critically. For example, I questioned 'why I felt that a strong emphasis on critical thinking influenced teaching

design thinking?' (05/08/09).

6. 3. 3 The importance of networking and communication

I learned about the importance of networking and communication. As explained in Chapter 2, I had great difficulty making contact with schools in England and it took a long time to find some to study. Researchers, who study in unfamiliar cultures, need gatekeepers in that culture to help them. University lecturers involved in teacher training courses introduced me to teachers in schools in both countries, and the teachers I visited first introduced me to others in Japan. I think my personality was problematic. I am very shy so I had to push myself to talk to so many people. Most importantly, I learned how to talk about the research using my own words in order to enable ordinary people to understand it. As a result, I finally established good relationships.

6. 3. 4 Combining document analysis and fieldwork

The combination of analysing policy documents and fieldwork was effective. Analysing policy documents enabled me to understand general ideas about craft education in both countries before conducting the fieldwork. Then I was able to examine how policy was translated into practice and if it was consistent or not. Because this research was comparative, it was especially important to understand the policy before I conducted the fieldwork. As previously reported, I had intended to employ the case study method. If I had used the case study method, it might have enabled me to study 'good' craft projects in depth; for example, I could have studied the tacit communication between teachers and students in good projects so as to understand it better. Unfortunately, this was impossible because I was unable to establish the right kinds of connections with schools.

6. 3. 5 Benefits of observation for studying craft teaching and learning

Observation enabled me to gather data in and from, real life situations and compare it with teachers' perceptions of craft education and policy makers' intensions. If I had not conducted observation in schools first hand, I would not have been able to find any evidence of skilled knowledge being taught in England, because it was not referred to in policy documents and was transmitted tacitly. The photographic data helped me to remember, reflect on and study later details that might have been ignored had I not recorded them visually. Since it was difficult to write down notes in the short time I had in schools, it was a good way of recording what was happening rapidly on the spot. However, it was also the case that my use of photography was rather limited. Photography could be used in this kind of research to record the process of developing craft objects visually and in detail. Digital video would be an even more effective way of recording craft learning in progress. This might help researchers understand the hidden aspects of craft learning and teaching better.

6. 3. 6 Limitations of data collection protocols

'Reliability' refers to whether the data collection tool or instrument produces consistent results. If the results of an investigation can be reproduced using the same or a similar method, then the research instrument is deemed to be reliable. However, reliability is rooted in a positivist research perspective and the quality of a study and each paradigm should be judged on its own terms. According to Lincoln & Guba, 'dependability' in qualitative research closely corresponds to the notion of reliability in quantitative research, meaning that the data should be gathered systematically and the results should make sense (1985; 300). To ensure reliability in qualitative research, a

researcher needs to examine and explain how they arrive at the results. This is mainly because in qualitative research, the researcher is her/himself an integral part of the research and it is the researcher who is the research instrument. In this research I observed craft projects in schools and interviewed some teachers and I used checklists to collect the observational data as systematically as I could. The design of these data collection instruments is explained in Chapter 2 and the observation checklists and interview schedules are included in Appendices. However, reliability was a particular problem when it came to the design of the observation checklists for use when I was observing teaching and learning in classrooms, because there were so many things to consider all at once that related to each other; for example, aims of lessons, activities, teaching and learning strategies and assessment methods and criteria.

I created two observation checklists: one was for documenting my observations of the Art, Art & Design, Design & Technology, Art and Art & Handicrafts departments in the schools and the other was for documenting my own observations of teaching and learning actually happening during lessons in classroom during craft projects. The first one listed four items for me to check: (i) the teaching environment (e.g. number of rooms); (ii) staff (e.g. number of teachers in the department and technicians and details of their professional backgrounds); (iii) curriculum documents (e.g. lesson plans) and; (iv) there was a space for miscellaneous notes. The second checklist listed seven items for me to observe and record: (i) the learning environment (e.g. displays such as posters or photos of artist work); (ii) specialist materials and tools; (iii) teaching resources; (iv) teaching and learning activities such as teacher demonstrations

(particularly for teaching design thinking and skilled knowledge); (v) teacher student interaction; (vi) the way the students' learning was being evaluated and; (ix) there was a space for making miscellaneous notes (Appendix IX). Under items (iv), (v) and (vi), I created groups of questions that would help me to focus my attention on aspects of learning in the classroom that were especially important for the research. For example, under the item 'teaching and learning activities' I formulated the following main question to help me to look for teaching and learning activities, content and strategies for design thinking:

> "What do teachers do to encourage students to explore and develop individual ideas?'

Under this, I created a group of seven sub-question that included:

> 'How is a theme/topic for a project introduced (orally or in writing, open/closed theme)?'
>
> 'How do teachers support students in evaluating their design ideas?'

When I observed craft lessons, I planned to write down data in the checklists directly by hand at first. However, I had difficulty in doing this because I could not find the right place to write down the data in the checklist quickly, and the spaces were not big enough (e.g. I wanted to write down short conversations between teachers and students). During classroom observations, I therefore used the checklists to help me think about what to write down observations about what I was looking at in a notebook. I did not experience any problems using the checklist to help me make notes when I observed the departments, because the data was visible for anyone to see; for example, numbers of rooms and specialist teachers. However, I found it difficult to use the second

checklist especially for making notes about items (iv), (v) and (vi). My comments about what I observed tended to be judgemental and as such, were based only on my personal knowledge and background experience of teaching craft education so they were limited in scope and rather subjective. The list of headings arising from the data in Japan in response to the questions, 'What do teachers do to encourage students to explore and develop individual ideas?' included in the checklist were: 'teaching design processes and stages', 'setting project titles', 'use of teacher instructions', 'showing exemplary work', 'giving worksheets', 'use of sketchbooks and notebooks', 'one to one teaching', 'learning from peers and books'. However, I had to add more data to my notebook as the fieldwork continued because my knowledge and understanding of craft education in Japan had improved. For example, at the beginning of the data collection in Japan I did not include the term *kanso* in the list, which is a form of self-evaluation in Japanese schools. I did not recognize that it was an important teaching and learning activity until the end of the fieldwork because I did not understand it was a form of evaluation at the time I collected the data in classrooms. In addition, the sub-questions for this item mainly focused on activities for generating ideas but not on self-evaluation, because I had anticipated that this did not take place in Japan. The understanding of teaching design thinking I gained from the review of literature and the research in England was not altogether appropriate for Japan and I made the mistake at first of trying to collect the same kind of data as in Japanese as in English schools.

Teaching and learning are very complex activities, and there are many aspects a researcher has to consider. However, the questions on the checklist I designed were

rather general and open ended, and they covered too narrow a range of teaching and learning activities as regards design thinking. For example, thinking about art curricula necessitates considering aims and purposes, contents, teaching and learning activities, teaching and learning strategies and assessment methods and criteria. However, I left out the dimension of evaluation. If I had formulated more specific questions about different methods of evaluating craft activities, I might have investigated evaluation activities more in-depth. For example, I might have posed the questions to myself 'is the teacher asking students to compare their work with exemplars by professional artists or with examples by students? If so how and when?' and 'are there any activities going on in Japan that are relevant to self-evaluation as understood in England?' Furthermore, this was a qualitative study, so I did not know exactly what I was going to find at the beginning of the research and had to keep reflecting on the data I was collecting and reporting. In terms of reliability in qualitative research, I should have reflected on the items and questions I listed in the observation checklists and what I wrote down in my notebooks more critically before and during the research. Perhaps, I should have read more about curriculum and observation method and included more ideas from the literature when I designed the checklist or asked someone to use it to see if they observed the same things as me.

6. 3. 7 Problems in studying curriculum

I posed the question for myself 'What teaching strategies are used to teach design thinking and skilled knowledge?' to help me explore craft policy and practice in two countries. However, I could only look at a part of what was taught in design thinking or skilled knowledge. In fact, I came across something important as well as strategies and

they were interconnected. Researching curriculum was more complex than I originally thought because there are so many different aspects of it that are interrelated as Eisner points out (1985). Therefore, I used the subtitle ‘Contexts, activities and teaching and learning strategies’ rather than ‘teaching and learning strategies’ in Chapters 3 and 4.

6. 3. 8 Absence of creative thinking

It was difficult for me to think ‘creatively’ when I started to analyse the data, and this made progress in the last stage of the research very slow. I struggled to select what was most important and reject what was not. Identifying similarities and differences during the comparison of data was even more difficult for me. I came to understand that my thinking is too rigid and I have learned not to classify my judgements simplistically as either right or wrong. This problem I experienced analysing data mirrors the one I actually investigated in this research; namely how to develop creative thinking in craft lessons. It shocked me to find out how much my own thinking had been influenced by cultural Japanese educational values and caused me great concern. However, towards the end of this research, I gradually understood the importance of taking ownership of my own ideas. I realised that if I did not decide on the outcomes for myself, I would never finish the research. I suspect other kinds of Japanese cultural attitudes and values, like patience and working hard to understand difficult problems, helped me to overcome these obstacles. As a researcher, this was a very important learning experience.

6. 3. 9 Craft education in Home Economics and Technology & Home Economic in Japanese schools

Of course I cannot claim to understand craft education in Home Economics and

Technology & Home Economic from analysing the policy documents alone. I should have conducted fieldwork into these school subjects in order to compare them fully with craft education in Art & Handicraft and Art. Because I discovered during the research that these school curricula were structured by the fundamental needs for living (practical knowledge) and emphasised skilled knowledge in the way that it was defined in this research. Further research into these school subjects would be useful for developing craft education within the school subjects of Art and Art & Handicrafts.

6. 3. 10 Lack of research in craft education in schools

When I conducted the review of literature I only found a few references to craft and craft education nationally and internationally, and the review chapter did not examine many ideas about skilled knowledge. Towards the end of this research, more books and research papers on this topic were published, such as 'The Craftsman' by Richard Sennett (2008) or 'Thinking through Craft' by Graham Adamson (2007). Sennett (2008) strongly criticised the lack of interest in craftsmanship in contemporary society though it plays an important role. Adamson explained 'craft even as existing only in motion' and 'as a way of doing things' (2007; 4). They both discuss and are attempting to recreate meanings of craft in contemporary society and the art realm and are concerned about the disappearance of the word 'craft' in society. However, there are still very few studies of craft education in schools.

6. 3. 11 Issues in report writing

Writing was a concern I had in this research. Eisner's model of educational connoisseurship and criticism requires researcher good writing skills and it is not easy to describe things holistically. My English writing skills are limited and English is a very

different kind of language from Japanese. Frequently I could not write things in English that I felt and witnessed that I could have expressed in Japanese; an example, '*kino atatakasa*' (warmth of wood). As I have explained, I tried to report meanings not just facts and this requires a high standard of English and writing skills. I know that the quality of the descriptions could be better.

6. 4 Implications for craft education theory, policy and practice

6. 4. 1 International audiences

Emphasising creativity in education has become a global phenomenon since the 1990s. Historically, craft education has been understood as less creative than fine art and as a practical subject only. This research convinced me that craft education can foster children's creativity if they are involved in both designing and making, and this is a strong rationale for retaining it in schools. However, while the aim of developing creative thinking seems to be a priority in both general education and art education in schools, the significance of skilled knowledge for creativity is not fully understood. In addition, the model of learning craft through apprenticeship is either misunderstood or misused (Ikuta, 1987).

Craftsmanship necessitates a close relationship between skilled knowledge and design thinking. Pye (1968) writes that skilled labourers always produce high quality in their work even though the quality is always at risk. It is evident that skilled knowledge is used to solve new or unfamiliar problems and there is always a risk of failure. Sennett (2008) understands that craftsmanship refers to the basic human desire to do a job well for its own sake, and always reflects a high degree of skilled knowledge. He points out that craft and craftsmanship are ignored in society today because people separate

‘hand and mind’ and ‘machines and human beings’ and pay no attention to their inter relationship. Some Japanese teachers in this research experienced similar ideas. In my view, skilled knowledge and design thinking should not be understood or taught separately. Craft education is necessary because it gives children the opportunity to experience craftsmanship through designing and making to completing objects skillfully and beautifully.

Arthur Efland (1976) called the art children produce in schools under the guidance of teachers ‘school art’ and expressed concerned about its lack of connection to the world outside and ‘students’ lives’. While contemporary schooling has many strengths, skilled knowledge and the traditional apprenticeship model of learning are neglected. I would designate the craft projects I studied in this research a form of ‘school craft’. Craft as taught in schools is not the same thing as craft practiced and appreciated outside. However, I do not wish to downplay craft teaching and learning in formal schooling, because the research identified a number of important justifications for it in the twenty-first century. Particularly, when students design and make craft objects from start to finish by themselves this requires them to use, develop and combine what Gardner calls ‘bodily, thinking and emotional skills’ together

6. 4. 2 Japanese audiences

This research established that *kogei* and *kosaku* have different educational roles. *Kogei* activities teach students to make objects skilfully, and are linked to traditional arts and crafts. *Kosaku* activities enable students to experiment with making objects in their own ways and explore their own ideas, materials and tools. However, the policy documents

do not show how these two rather different approaches are supposed to link together. Since it takes time to acquire craft knowledge, policy makers should provide guidance on how to learn craft knowledge and skills sequentially over the whole period of formal schooling. They could specify different kinds and levels of craft skills that should be covered by teachers for each school year in the Courses of Study, documents about assessment and teacher guidelines for Art & Handicraft and Art so that students accumulate and develop skills effectively. However, more research is needed to examine if it is really possible to link *kogei* and *kosaku* and if so, how.

I agree with Csikszentmihalyi that the influence of the subject domains in Art & Design curricula on how craft education is taught and learned is highly significant especially as regards the goal of creativity (Csikszentmihalyi, 1999). There was no explicit specification for teaching thinking skills in the subject domains of Art & Handicraft and Art in Japan. I have developed a domain model for craft education in Japanese schools that borrows ideas from the programmes of study in the English national curriculum for Art & Design and Design & Technology (Figure 6.5). This model emphasises the role of divergent thinking and self-evaluation in design thinking and specifies four learning domains. One domain refers to ‘exploring, developing and communicating ideas’, because this is not included in Japanese policy and practice. The second domain refers to ‘acquiring practical knowledge of materials, tools and equipment’, and ‘working with materials, tools and equipment and making objects skillfully’. In other words, all the kinds of knowledge I found out were important in this research. The third is about ‘self-evaluation of student work’. The fourth refers to ‘understanding crafts from various cultures and times’. The third and fourth domains could be equated with ‘art

appreciation' because self-evaluation was included as a part of Art Appreciation in the Japanese art curricula but it was not dealt with in much detail. But I think it ought to be included in art making too. I made it an independent domain so as to emphasize it. I recommend that Japanese policy makers include and specify a domain of learning called 'design thinking' in the Courses of Study for Art & Handicraft and Art like the domain model I designed.

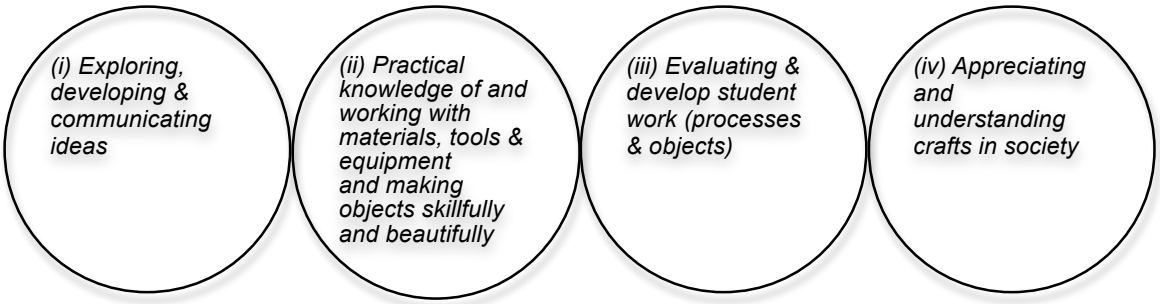


Figure 6. 5 A learning domain model for craft education in Japanese

. .

The finding about the limited kinds of crafts being taught in *kogei* is significant educationally because it could negatively influence students' understanding of crafts in society. If students do not have opportunities to learn how *kogei* is practised in society, they will leave school with very narrow ideas about craft. Policy makers should emphasise the importance of teaching and learning contemporary artist crafts and crafts from other countries, not just traditional Japanese ones in the Courses of Study. Also, the authorized textbooks should include more examples of them for teachers to use in their lessons; for example, works by Tsukasa Kofushiwaki, who creates non-functional Japanese lacquer crafts and batiks from South East Asia, which I saw being taught in an English secondary school during this research.

While Japanese policy emphasises creativity and creative problem solving because this

is understood as a means to develop autonomous learning, this research confirmed that teachers did not actually teach students how to express their own ideas or engage in critical thinking about their own and each others' work. Not surprisingly therefore, students struggle to develop their own artistic ideas. The review of literature on creativity and design education identified a range of strategies that teachers could use to develop Japanese students' design thinking skills and abilities. I recommend therefore that policy makers introduce them into school and teacher training curricula and provide guidelines for teaching design thinking in craft and art. I learned from the research in England and the literature review that Japanese art teachers could include design thinking into their lessons and assessment procedures by:

(i) providing more detailed project themes as starting points for projects;
(ii) teaching more flexible design processes;
(iii) including research and self-evaluation;
(iv) encouraging reflection on processes;
(v) using more external resources such as museums or craftspeople;
(vi) encouraging students the use of sketchbooks to record information and communicate ideas;
(vii) using formative assessment.

These new teaching methods should be taught to student teachers in initial teacher training courses and in professional development seminars for practising teachers. Moreover, the teacher guidelines published by the government and textbook companies should include them together with examples of craft projects so that teachers can understand how to use them in practice.

Furthermore, the review found that studies in creativity and design education claim that teachers should prioritise risk taking by students, build intrinsic and extrinsic motivation

and confidence, and stimulate interest and curiosity in order to foster their creativity. As this research did not examine these matters in depth, other Japanese researchers need to follow up this work and investigate in more detail how best these suggestions could be implemented.

I have created a design process model intended to improve the teaching of design thinking in Japan. The main aim is to get teachers to introduce thinking processes that assist the development of divergent thinking, critical reasoning and flexible thinking into their craft making projects. The model has six components and starts with 'Understanding the project theme'. The next stage emphasises the interaction between 'Investigation & exploring', 'Practising craft techniques', 'Generating & developing ideas' and 'Making', so as to stimulate flexible ways of developing ideas. I particularly want to promote ways of developing students' own designs for craft objects through practising techniques and making, because I found that some Japanese teachers already considered craft knowledge important for developing their own design ideas. Also, I want to emphasize the importance of divergent thinking in the design process, because this was neglected in the craft lessons I observed in Japan. Furthermore, 'reflection on the design and making process' is included in this model so as to encourage students to develop ideas in process and improve their learning skills. I also want to emphasize the importance of completing craft objects from beginning to end because research has shown that craft education is about making craft objects skilfully and beautifully.

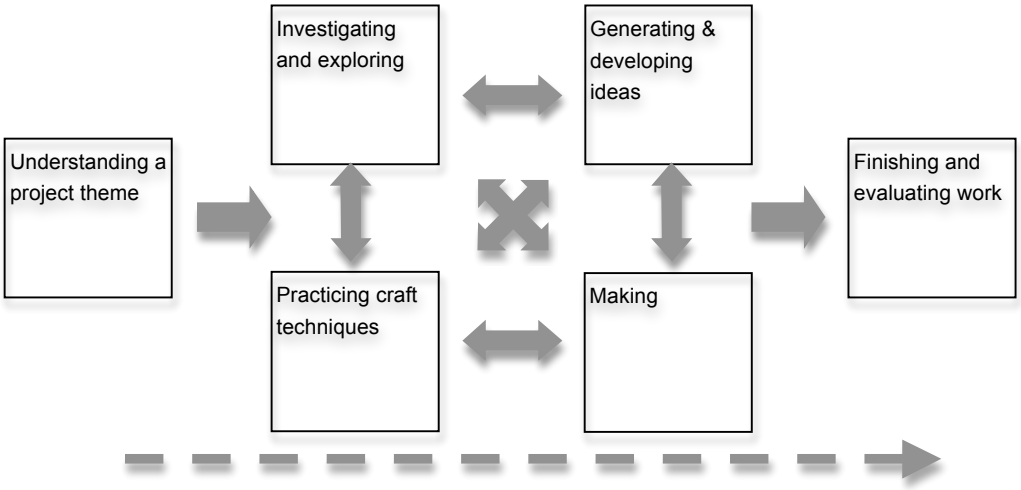


Figure 6. 6 An interactive design process model for craft projects in Japanese schools

As this suggested model is based solely on the results of this research, it needs to be tested, validated and developed further. Whilst admitting that this is a limitation, it is still important for policy makers to introduce an interactive design process model to craft teachers in Japan so that they can develop their teaching of design thinking skills better in craft lessons.

6. 4. 3 English audiences

Although I did not study craft education in England in depth, I have attempted to draw out a few implications for research in craft education there. This study confirmed that craft education in England is declining. One strength of craft education in Japan is the way it clearly specifies craft knowledge in policy and practice. Making a craft object that is functional skillfully and beautifully is a key characteristic of craft knowledge, but this was not always emphasized in Art & Design in England. In craft projects, therefore, I recommend that an aesthetic criterion is included in the aims and assessment criteria in the National curricula and GCSE syllabuses for the two subjects. In particular, it is

important to establish domain specific objectives for craft learning because they are not explicit in English policy and practice.

A strength of *kogei* in Japan is that it includes craft in everyday life (non - artist crafts). This is not the case in England. From the specialist literature, it is clear that people continue to make things at home and engage in do-it-yourself activities, in both countries and this gives them a sense of ownership over and identity in their lives. *Kogei* includes Japanese traditional and local forms of crafts. Whereas crafts from other cultures were more in evidence in England, the literature suggested that crafts are widely used in society in general as vehicles for cultural transmission. Art educators in England should reflect on this more often when they explore ideas like cultural identity with their students. Policy makers could include an example of a project about teaching traditional and local crafts in official schemes of work, and local boards of education could develop good examples of local craft projects and introduce them into their schools.

In Japan, craft education in schools is understood as character forming in that it teaches students a sense of responsibility and the importance of hard work. In craft lessons, students have to take responsibility for all the processes involved in making a piece of craftwork and handling and caring for the tools. This teaches them concentration and the values of patience and hard work. This is a strong justification for craft education that could help to promote it better in schools in England. These positive attitudes are fostered particularly well through learning skilled knowledge when students complete craft objects from start to finish by themselves.

The term ‘craft’ did not exist in the subject of Design & Technology in England, but references to ‘skilled knowledge’ was more evident in this subject than in Art & Design. Although I could not study practice in this subject in-depth, the visits to schools gave me important insights into how to teach designing and making. In Design & Technology lessons, students typically made commercial and industrial products, but the production processes they engaged in were not really up to date with technological developments in society because they designed and made them from beginning to end themselves. This does not happen very often in the real world of product design, where designers create designs for mass production and makers and machines operate separately to fabricate them. However, the students experienced a sense of responsibility for their ideas when they designed and made these objects from start to finish. Also, some teachers told me that this helps students develop making skills that are useful not only for commerce or industry, but also for domestic life. Art educators should not forget the need to help students develop useful practical knowledge and skills for their future lives, for instance, cooking supper, or repairing a bookshelf for the family or themselves. Policy makers ought to promote the value of learning practical skills that are useful in everyday life, and to include acquiring skills and knowledge of domestic crafts into their aims for craft learning in schools, together with the other aims.

I observed a lot of group work in Japan, but in England students mainly worked individually. Sennett (2008) claims that ‘high craftsmanship’ occurs when people work as groups in society; for example, in some Japanese car companies, staff work as a team to invent and produce good quality, innovative products. I recommend that art educators in England should use group work more. Policy makers could include

developing students' competence to work with others as a general education aim in the National Curriculum and as a specific aim in Art & Design and Design & Technology curricula and encourage teachers to use group work in craft projects.

6. 4. 4 Future research

Internationally, there is very little research being done on craft and craft education. One possible reason is that craft in society and craft education in schools have a low priority and status, particularly in Western countries. This makes the situation worse. There is a need to conduct more research into craft and craft education nationally and internationally.

The methodological challenge for craft and craft education is how to study tacit knowledge, which exists in social practice but is not separate from it. In order to research craft understood as situated learning, more ethnographic type studies are needed. Researchers need longer periods of observation of craft lessons and to conduct case studies in single schools. Also, they need to find more creative ways of designing and using data collection instruments, including visual methods such as video recording or photography. For example, video recording would be helpful for analysing how teachers demonstrate making objects to students visually and verbally.

One question that arose during this research was where and how skilled knowledge should be learned in society and if schools are the right place for it. According to Hida (2006), craft learning is non-institutional by nature and traditionally occurred outside formal educational institutions. Other scholars explain the apprenticeship model of learning as unstructured as opposed to structured. It is probably easier for people to

learn craft outside school. I would like to research this in the future.

The research discovered teaching methods used to develop students' design thinking in England with potential to inform the *kogei* and *kosaku* curriculum in Japan. However, it was not possible to extend this study into curriculum development. So it is recommended that in future the research findings are used as a basis for designing, implementing and evaluating craft projects in Japan that aim to develop design thinking together with skilled knowledge. This was a small scale study and more studies are needed that explore the relationship between design thinking and skilled knowledge in craft projects. Research is needed also that designs and evaluates experimental craft projects. I studied one such project in England called *Making It Work*, which experimented with the use of professional craftspeople in schools. This project convinced me that it is necessary to design, implement and evaluate such projects systematically in order to develop craft curricula, but I did not come across these kinds of project in Japan.

6. 5 Postscript

Overall, this research has enabled me to build up my research skills and develop ideas for my own teaching. I have learned how to reflect on my own learning and teaching experience, despite considerable difficulties. I can say that I developed my own sense of craftsmanship and learned how to become a creative thinker in addition to contributing new knowledge of craft education to international theory and practice.

I learned about 'scientific' research methods, which are not widely understood or used in Japanese art education and was able to put them into practice. At the beginning of

the research, I had rather fixed ideas about research methodology and data collection methods because my knowledge was attained from books and the experience of doing research at Master's level. Completing this thesis in England helped me to understand this.

I started this research in 2005 and my awareness of different cultures has increased through living and studying in a multicultural society. At the beginning of my studies in England, I felt from my experience that art and art education in Japan was inferior and found everything in English art education better. This was partly because I had the fixed and narrow idea learned in Japan that Western education systems are superior. Through comparing craft education in the two countries, I gradually came to recognize positive aspects of Japanese education and realized I could not explain all the findings about Japanese craft education using theories developed in the West. I feel strongly that a cultural perspective on art education is important for art educators in Japan. Completing this thesis in English is important because it will introduce English language speakers to craft education in Japan. Very little research about Japanese craft education has been translated into English.

In my future teaching, I will stand by the position that creativity should be developed in craft lessons and I plan to use some of the teaching strategies identified in this research. Also, I will not hesitate to teach skilled knowledge as long as it is understood as relating to creative thinking. Through this investigation, I have learned that bringing theory into my own teaching will help me to better reflect on and evaluate my teaching practice.

The research problem originated from my personal experience and interests. However,

the focus was very vague to me in the early stages. The research was a personal journey that set out to clarify what I had already learned and to increase my knowledge and understanding of skilled knowledge and design thinking in order to seek explanations for how to improve this. Despite the fact that I have faced many problems in this research I wanted to do my best to produce good quality work for my own sake and to satisfy my curiosity about craft teaching and learning. I look back now on my research as a quest for craftsmanship, and in reflection consider this as the ‘craft’ that I studied.

GLOSSARY

Aesthetic value: Value people attach to the appearance of objects - what people find beautiful.

Apprenticeship: A model of learning in which a novice learns from an expert through observation and by practicing techniques repeatedly. Traditionally this is used in informal education situations (e.g. a tailors' workshop) and occurs when the novices participate in a specific cultural community.

Art & Design: A school subject in England in which students learn about designing and making visual art.

Art & Handicraft: A school subject in Japanese primary schools, which focuses on making and appreciating artefacts and nature.

Art *(bijutsu):* A school subject in Japanese secondary schools, which focuses on making and appreciating artefacts and nature.

Comparative educational research: A type of comparative educational research, which is weighed more toward findings for one location than the other.

Craft (*kogei* and *kosaku*): A domain of a school subject, that focuses on making objects.

Craft education: Teaching and learning that focuses on acquiring skilled knowledge and making objects from start to finish by students

Craft knowledge: A form of skilled knowledge (.how to make things). That is concerned with creating objects skilfully and beautifully through the manipulation and control of materials, tools equipment and processes.

Crafts: Making activities associated with specific materials, tools, techniques and processes and named as a 'craft' (e.g. weaving, wood carving).

Craftsmanship: The basic human desire to do a job well for its own sake, which is founded on a high degree of skilled knowledge (Sennett, 2008).

Creativity: Imaginative activities fashioned so as to produce outcomes that are original and of value (DfEE, 1999; 29).

Curriculum content: What teachers teach in lessons.

Curriculum: A series of planned events that are intended to have educational consequences for one or more students (Eisner,1994; 31).

Design & Technology: A school subject in England in which students learn about designing and making products made out of resistant and non-resistant materials.

Design thinking: A mode of thinking in which people generate and develop their own ideas for making objects /products (Noman, 2000).

Design: A domain of a school subject that focuses on the creative problem solving processes used to design products.

Formative assessment: A type of assessment that occurs throughout the processes of learning and focuses on providing ongoing feedback for the purposes of improving practice.

Higher order thinking: A mode of thinking that involves complex judgemental skills such as problem solving and critical thinking.

Objectives: Specific goals that one hopes to achieve through the educational program that is provided (Eisner, 1994; 108).

Practical knowledge: Knowledge of making and mending things in everyday life.

Skilled knowledge: Knowledge of how to manipulate materials and tools skilfully.

Skills: Learned or trained knowledge of practice.

Strategy: A way of delivering curriculum content (e.g. through demonstration).

Summative assessment: A type of assessment that occurs usually at the end of a project or course of study and focuses on outcomes.

Tacit knowing: A process of knowing that enables people to do something without articulating how (Polanyi, 1973).

Techniques: Specific ways of working with materials and using tools and equipment to make certain kind of crafts (e.g. chain or cross stitch in embroidery).

BIBLIOGRAPHY

Adamson, G. (2007). *Thinking through Craft.* London: Berg Publishers.

Addison, N. and Burgess, L. (Eds.). (2003). *Learning to teach Art and Design in Secondary school*. London: Routledge.

Ahern, K. J. (1999). Ten Tips for Reflexive Bracketing. *Qualitative Health Research.* Vol.9, No.3, pp. 407-411.

Amabile, T. (1983). *The Social Psychology of Creativity.* New York: Springer-Verlag.

Amabile, T. (1996). *Creativity in Context*. Colorado: Westview Press.

Amulya, J. (2004). *What is Reflective Practice?* Available from http://crcp.mit.edu/. (10/05/07).

Anderson, G. (1990). *Fundamentals of Educational Research*. London: Falmer Press.

AQA (2006a). *General Certificate of Secondary Education, Art and Design 2006 Full and Short Course*. London: AQA.

AQA (2006b). *General Certificate of Secondary Education, Design and Technology (Electronic products) 2006 Full and Short Course*. London: AQA.

AQA (2006c). *General Certificate of Secondary Education, Design and Technology (Graphic Products) 2006 Full and Short Course.* London: AQA.

AQA (2006d). *General Certificate of Secondary Education, Design and Technology (Product Design) 2006 Full and Short Course*, London: AQA.

AQA (2006e). *General Certificate of Secondary Education, Design and Technology (Resistant Materials Technology) 2006 Full and Short Course.* London: AQA.

AQA (2006f). *General Certificate of Secondary Education, Design and Technology (System and Control Technology) 2006 Full and Short Course.* London: AQA.

AQA (2006g). *General Certificate of Secondary Education, Design and Technology (Textiles Technology) 2006 Full and Short Course*. London: AQA.

AQA (2006h). GCSE Art & Design Unendorsed - Controlled Test, by Assessment and Qualifications Alliance. June 2006.

Archer, L, B. (1974). Design in General Education. Presented at the Design in General Education Summer School, July, 1974, Royal College of Art, London.

Ash, A., Hall, J., Meecham, P. and Montgomery-Whicher, R. (2000). Attitudes to Making. In N. Addison and L. Burgess (Eds.). *Learning to Teach Art & Design in the Secondary School: A Companion to School Experience*. London: RoutledgeFalmer.

Banks, F. (1994). *Teaching Technology*. London: Rutledge.

Baynes, K. (1985). A Design Dimension for the Curriculum. *Journal of Art and Design Education*. Vol. 4, No. 3, pp. 237-244.

Bayns, K. (2006). A Design Dimension of the Curriculum. In *Design Education: Now You See It, Now You Don't.* An extensive report of a Seminar by the National Society for Education

in Art and Design and the Design & Technology Association with the support of the Department for Education and Skills. The Royal College of Art, London. 11 July 2006.

Beattie, D, K. (2000). Creativity in Art: the Feasibility of Assessing Current Concepts in the School Context. *Assessment in Education*. Vol.7, No.2, pp.175-192.

Bedford, D. (2002). Craft in the 1990s: Provision and Practice at Key Stages 3&4 in England and Wales. Unpublished PhD Thesis. Roehampton, University of Surrey.

Bell, J. (1989). *Doing Your Research Project*. Milton Keynes: Open University Press.

Bentley, T. (2000). Learning for a Creative Age. In D. Puttnam (Ed.). *Education Futures*. London: Royal Society for the Encouragement of Arts, Manufactures & Commerce & the Design Council.

Boden, M. (1990). *The Creative Mind*. London: Sphere Books.

Boden, M. (1994). What is Creativity? In M. Boden (Ed.). *Dimensions of Creativity.* Cambridge, Massachusetts: The MIT Press.

Borg, K. (2001). Art and Craft as School Subject (Solyd): Impression - Expression-Imprement. Unpublished PhD Thesis Dissertation. Linkopings Universitet. Sweden.

Bray, M. (2007). *Actors and Purposes in Comparative Education*. In M. Bray, B. Adamson and M. Mason (Eds.) (2007). *Comparative Education Research, Approaches and Methods*. Hong Kong: Comparative Education Research Centre.

Bray, M., Adamson, B. and Mason, M. (2007). *Comparative Education Research, Approaches and Methods.* Hong Kong: Comparative Education Research Centre.

Brown, N, C, M. (1997). Theorising the Craft: New Tricks of Trades. In S. Rowley *Craft and Contemporary Theory*. Sydney: Allen & Unwin.

Bryman, A. (2001). *Social Research Method*. Oxford: Oxford University Press.

Buchanan, R. (2000). Wicked Problems in Design Thinking. In R. Buchanan and V. Margolin (Eds.). *The Idea of Design.* London: The MIT Press.

Burgess, L. (2003). Resource – Based Learning (RBL). In N. Addison and L. Burgess (Eds.). *Learning to teach Art and Design in Secondary School*. London: Routledge.

Burgess, L. and Schofield, K. (2003). Issues in Craft and Design Education. In N. Addison and L. Burgess (Eds.). *Learning to Teach Art and Design in Secondary School*. London: Routledge.

Butterworth, L. (2006). The Role of Craft in Reshaping Design Education. In *Design Education: Now You See It, Now You Don't.* An extensive report of a Seminar by the National Society for Education in Art and Design and the Design & Technology Association with the support of the Department for Education and Skills. The Royal College of Art, London. 11 July 2006.

Campbell, A., Freedman, E., Boulter, C. and Kirkwood, M. (Eds.) (2003). *Issues and Principles in Educational Research for Teachers.* Southwell: British Educational Research Association.

Cohen, L., Manion, L. and Morrison, K. (2000). *Research Methods in Education.* London: Routledge Falmer.

Collins, S., Brown, S. and Holum, A. (1991). Cognitive Apprenticeship: Making Thinking Visible. Reprinted with permission from *American Educator*. Winter 1991.

Coy, M. (1989). *Apprenticeship: From Theory to Method and Back Again*. New York: SUNY Press.

Creswell, J, W. (2003). *Research Design, Quantitative, Qualitative and Mixed Methods Approaches*. London: SAGE Publication.

Cropley, A, J. (1997). Fostering Creativity in the Classroom: General Principles. In M. A. Runcco (Ed.). *Creativity in Research Book*. Cresskill, New Jersey: Hampton Press.

Csikszentmihalyi, M. (1996). *Creativity: Flow and the Psychology of Discovery and Invention*. New York: Harper Collins.

Csikszentmihalyi, M. (1999). *Implications of a systems perspective for the study of creativity*. In R. J. Sternberg (Ed.). *Handbook of Creativity.* Cambridge: Cambridge University Press.

de Bono, E. (1982). *Edward deBono's Thinking Course*. London: BBC.

de Bono, E. (1992). *Serious Creativity*. London: HarperCollins.

DeCoker, G. (1998). Seven Characteristics of a Traditional Japanese Approach to learning. In J. Singleton (Ed.). *Learning Likely Place*. Cambridge: Cambridge University.

Department of Education and Science (1991). *The National Curriculum Art Working Group, Interim Report.* London: HMSO.

Design Council (2006). *What is Design?* Available from http://www.designcouncil.org.uk/. (02/14/2007).

DfEE (1999). *All Our Futures: Creativity, Culture and Education.* London: DfEE.

DfEE and QCA (1999). *Art and Design, the National Curriculum for England, Key Stage 1-3.* London: DfEE and QCA.

DfEE and QCA (2004). *Design and Technology, the National Curriculum for England, Key Stage 1-4.* London: DfEE and QCA.

Dissanayake, E. (1988). *What is Art for?* Seattle: The University of Washington Press.

Dissanayake, E. (1992). The Pleasure and Meaning of Making. *American Craft*. Vol.55, No.2, pp.40-45.

Dormer, P. (1997). *The Culture of Craft*. London: Manchester University Press.

Edexcel (2002a). *Edexcel GCSE in Design & Technology: Textiles Technology (1971)*. London: Edexcel.

Edexcel (2002b). *Edexcel GCSE in Design & Technology: Resistant Materials Technology (1973)*. London: Edexcel.

Edexcel (2002c). *Edexcel GCSE in Design & Technology: Systems & Control (1974)*. London: Edexcel.

Edexcel (2002d). *Edexcel GCSE in Design & Technology: Graphic Products (3972).* London: Edexcel.

Edexcel (2003). *Edexcel GCSE in Art & Design (1027–1032), Edexcel GCSE (Short Course) in Art & Design (3027–3032)*. London: Edexcel.

Efland, A. (1976). The School Art Style: A Functional Analysis. *Studies in Art Education*. Vol.17, No.2, pp.37-43.

Eggleston, J. (2000). What is the Design and Technology Education?'. In F. Banks (Ed.). *Teaching Design and Technology.* London: Routledge.

Eisner, E. W. (1972). *Educating Artistic Vision*, New York: Macmillan publishing.

Eisner, W, E. (1985) (1994). *The Educational Imagination: On the Design and Evaluation of School Programs.* New York: Macmillan.

Elliot, J. (1991). A model of Professionalism and Its Implications for Teacher Education. *British Education Research Journal*. Vol.17, No.4, pp309-318.

Enohara, K. (2007). 生涯教育としての美術教育 (Art Education as Lifelong Education). In O. Miyawaki (Ed.) *美術科教育の基礎知識 (Basics in Art Education).* Tokyo: Kenpakusha.

Fairbrother, P, G. (2007). Qualitative and Quantitative Approaches to Comparative Education. In M. Bray, B. Adamson and M. Mason (Eds.). *Comparative Education Research, Approaches and Methods.* Hong Kong: Comparative Education Research Centre.

Fasciato, M. (2002). Designing – What Does It Mean at Key Stage 2 and 3?. In S. Sayers, J. Morley and B. Barnes (Eds.). *Issues in Design and Technology*, London: RoutledgeFalmer.

Fautley, M. and Savage, J. (2007). *Creativity in Secondary Education*. Exeter: Learning Matters.

Feldman, D, H., Csikszentimihalyi, M. and Gardner, H. (1994). *Changing the World: A Framework for the Study of Creativity.* New York: Praeger.

Fischer, K. (1980). A Theory of Cognitive Development: the Control of Hierarchies of Skill. *Psychological Review*. No.87, Vol.6, pp.477-531.

Freedman, K. (2003). Recent Shifts in US Art Education. In N. Addison and L. Burgess (Eds.). *Issues in Art and Design Teaching.* London: Routledge Falmer Press.

Freeland, C. (2001). *Art Theory: A Very Short Introduction.* Oxford: Oxford University.

Fujita, H. (Ed.) (2008). *近代工芸運動とデザイン史 (Modern Craft and Design Movements)*. Kyoto: Shibunkaku.

Fukumoto, K. and Sugiyama, N. (2007). A Study of the Problem – Based Learning in British Design Education, Towards a Reconstruction of the Concept of Design Education. *Journal for Society of Art Education*. Vol.0, No.40, pp.177-184.

Garber, E. (2002). Craft Education in Finland: Definitions, Rationales and the Future. *Journal of Art and Design Education.* Vol. 21, No.2, pp. 132-145.

Gardner, H. (1983). Frames of Mind: The Theory of Multiple intelligences. New York: Basic Books.

Gardner, H. (1989). The Key in the Slot; Creativity in a Chinese Key. *Journal of Aesthetic Education*. Vol.23, No.1, pp.141-158.

Gardner, H. (1990). *Art Education and Human Development*. Los Angeles: J. Paul Getty Trust.

Geertz, C. (1973). *The Interpretation of Cultures*. New York: Basic Books.

Guilford, P. (1950). Creativity. *American Psychologist*. No. 5, Vol. 9, pp. 444-454.

Guilford, P. (1976). *The Nature of Human Intelligence.* New York: McGraw-Hill.

Hall, J. (1995). *A Strategy in Face of an Impossible Task*. In R. Prentice (Ed.). *Teaching Art and Design; Addressing Issues and Identifying Directions.* London: Continuum.

Hamamoto, M. (1992). 子どもの発達と手しごと　工作 (Children's Development and Handwork and Kosaku). In *美術教育を進める会、手しごと　工作と美術教育 (Handwork & Kosaku and Art Education)* (Ed.). Tokyo: Ayumishuppan.

Hennessy, S. and McCormick, R. (2002). The General Problem-Solving Process. Myth or Reality?. In G. Owen-Jackson (Ed.). *Teaching Design and Technology in Secondary Schools.* London: RoutledgeFalmer.

Hickman, R. (2005). *Critical Studies In Art & Design Education*. Bristol: Intellect books.

Hida, T. (2006). *工芸の領分(A Domain of Kogei)*. Tokyo: Bigakushuppan.

Houghton, N. (2000). Craft in English and Welsh Secondary Schools: The Pupils' Perspective. Unpublished PhD Thesis. Roehampton, University of Surrey.

Houghton, N. (2005). Benefits to the Learner of 21st Century Craft. Presented in Craft Conference, February, 2006. Unpublished Report to QCA prepared in association with the Crafts Council. October 2005.

Howarth, M. (1991). *Britain's Educational Reform - Comparison with Japan.* London: Rutledge.

Howe, A., Davies, D. and Ritchie, R. (2001). *Primary Design and Technology for the Future Creativity, Culture and Citizenship*. London: David Fulton.

Idekawa, N. (1997). *人間復興の工芸 (Koge for Human Revival)*. Tokyo: Heibonsha.

Ikeuchi, Y. (2000). Evaluation Standards for Promoting Cognitive Expertness and Transfer in Arts – Importance of Acquiring Evaluation Standards in the Faculty of Art Portfolio. *The Association of Art Education*. Vol.0, No.0, pp.13-27.

Ikuta, K. (1987). *技から知る (Learning from Waza).* Tokyo: Tokyo University.

Isaac, B. (1986). Design and its Relationship to Craft and Technology. In A. Dyson (Ed.). *Art and Design Education: Heritage and Prospect*. London: Institute of Education.

Iwano, M. (1999). Japanese Art Education: From Internationalization to Globalization. In R. Mason and D. Boughton (Eds.). *Beyond Multicultural Art Education: International Perspectives.* Waxman: Berlin and New York.

Julier, G. (2000). *The Culture of Design*. London: Sage.

Kairyudo (2006a). *こころのキャンバス５・６上 (Campus of Kokoro* 5&6, 1), Tokyo: Kairyudo.

Kairyudo (2006b). *こころのキャンバス５・６下 (Campus of Kokoro* 5&6, 2), Tokyo: Kairyudo.

Kairyudo (2006c). *美術１ (Art 1)*. Tokyo: Kairyudo.

Kairyudo (2006d). *美術２＆３上 (Art* 2&3, *1)*. Tokyo: Kairyudo.

Kairyudo (2006e). *美術２＆３下 (Art* 2&3, 2*)*. Tokyo: Kairyudo.

Kairyudo (2007a). *私たちの家庭科５・６ (Our Home Economics,* 5 & 6). Tokyo: Kairyudo.

Kairyudo (2007b). *技術家庭 技術 (Technology & Home Economics, Technology).* Tokyo: Kairyudo.

Kairyudo (2007c). *技術家庭 家庭 (Technology & Home Economics, Home Economics).* Tokyo: Kairyudo.

Katter, E. (1995). Multicultural Connections: Craft Community. *Art Education*. Vol. 1, No.1, 48, pp. 8-13.

Kimbell, R. (1986). *Craft Design and Technology*, Milton Keynes: Open University.

Kimbell, R. and Perry, D. (2001). *Design and Technology in a Knowledge Economy.* London: Engineering Council.

Kimbell, R., Stables, K., Wheeler, T., Wolziak, A. and Kelly, V. (1991). *The Assessment of Performance in Design and Technology*, *APU*. London: School Examination and Assessment Council/Central Office of Information.

Kitazawa, N. (2000). *境界の美術史(Art History of Border).* Tokyo: Seiunsha.

Koskennurmi-Sivonen, R. (1998). *Creating a Unique Dress*, Helsinki: AKATIMI.

Krippendorff, K. (2004). *Content Analysis: An Introduction to its Methodology.* (2nd edit.). Thousand Oaks, CA: Sage.

Kubouchi, K. (2004). A Historical Study of the Organization of Girls' Education. *Yamawaki Studies of Arts and Science*. Vol.0, No.42, pp.1-15.

Kumamoto, T. (1970). 工作、工芸教育の歴史 (History of *Kosaku* and *Kogei* Education). In N. Yukawa (Ed.). *美術教育体系８工作、工芸 (Art Education Compendiums 8 Kosaku, Kogei)*. Tokyo: Gakugeishorin.

Lave, J. and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation.* Cambridge: Cambridge University Press.

Lawson, B. (1980). *How Designers Think*. London: Archtechtual Press.

Lewis, T. (2005). Creativity - A Framework for the Design/Problem Solving Discourse in Technology Education. *Journal of Technology Education*. Vol. 17, No. 1, pp. 35-52.

Lincoln, Y. and Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

Lincoln, Y. and Guba, E. (1990). Judging the Quality of Case Study Reports. *Qualitative Studies in Education.* Vol.3, No.1, pp.53-59.

MacDonald, S. (1970). *The History and Philosophy of Art Education*. Cambridge: Lutterwhorth press.

Maeda, M. (1997). 学習指導と教育評価 (Teaching and Assessment). In Maeda, M. and Tojo, M. (Eds.). *読んでわかる教育心理学 (Educational Psychology).* Tokyo: Shihotosho.

Mason, R. (2004). Making It Work Phase One: Evaluation Report. Unpublished Report. London: Roehampton University.

Mason, R. (2000). The Meaning and Value of Craft. In Hickman, R (Ed.). *Art Education 11-18*. London: Continuum.

Mason, R. and Houghton, N. (2002). Educational Value of Making. In S. Sayers and J. Morley (Eds.). *Issues in Design and Technology Teaching*. London: Routledge Flamer.

Mason, R. and Iwano, M. (1995). *Pupils as Makers: Aspects of Craft in Secondary Schools in England and Wales.* London: Crafts Council.

Mason, R., Nakase, T., and Nakase, N. (2000). Craft Education in Lower Secondary Schools in England and Japan. *Comparative Education.* Vol.36, No.4, pp.397-416.

McFee, J, K. (1995). Change and the Cultural Dimensions of Art Education. In R. Neperud (Ed.). *Context Content and Community in Art Education Beyond Postmodernism*. London: Teacher College Press.

MEXT (1999a). *小学校学習指導要領 解説―図画工作編 (The Course of Study for Art & Handicraft).* Osaka: Nihon Bunkyo.

MEXT (1999b). *中学校指導要領（平成１０年１２月）解説―美術編 (The Course of Study for Art)*. Tokyo: MEXT.

MEXT (1999c). *小学校指導要領 解説―家庭科編 (The Course of Study for Home Economics)*. Tokyo: MEXT.

MEXT (1999d). *中学校指導要領（平成１０年１２月）解説―技術・家庭編 (The Course of Study for Technology & Home Economics).* Tokyo: Tokyo Shoseki.

MEXT (2001). *小学校児童指導要録，中学校生徒指導要録，高等学校生徒指導要録，中等教育学校生徒指導要録並びに盲学校，聾学校及び養護学校の小学部児童指導要録，中学部生徒指導要録及び高等部生徒指導要録の改善等について（通知）(An Notification about Improvements for Shidoyoroku in Primary Schools, Lower Secondary Schools, Upper Secondary Schools and Schools for Special Needs Education)*. Available from www.mext.go.jp (20/10/2007).

MEXT (2006). *小学校、中学校、高等学校、キャリア教育推進の手引き (Primary and Secondary Schools, Handbook of Career Education).* Tokyo: MEXT.

MEXT (2007). 教科書制度の概要 (The Outline of the Textbook System). Available from http://www.mext.go.jp/a_menu/shotou/kyoukasho/gaiyou/04060901.htm. (05/01/2010)

Mioduser, D. and Kipperman, D. (2002). Evaluation/Modification Cycles in Junior High School Students' Technological Problem Solving. *International Journal of Technology and Design Education.* Vol. 12, No. 2, pp123-138. Netherland: Kluwer Academic Publishers.

Miyahara, S. (1995). 解説 (Explanation). In J. Dewey (1915). *The School and Society.* Tokyo: Iwanami.

Mizui, M. (1992). 手の発達と造形素材に関する考察 (Development of Handwork and Craft Materials). In K. Manabe (Ed.). *現代造形、美術教育の展望 (The Outlook for Contemporary Art and Art Education).* Tokyo: Shinyousha.

Mizukami, Y. (2007). 工芸における用途　材料　技能などの学習要素と学習環境について述べよ（Describe Learning Elements such as Function, Materials and Skills and Learning Environment in Kogei）. O. Miyawaki (Ed.). *美術科教育の基礎知識（Basics in Art Education）*. Tokyo: Kenpakusha.

Mizushima, N. (2009). 美術科における学習意欲の形成 (Developing Motivation of Learning in Art). Unpublished paper, Tokyo: Seishinjoshi University.

Morley, J. (2002). How Can We Meet the Challenges Posed by a New Model of Practical Scholarship?. In S. Sayers, J. Morley and B. Barnes (Eds.). *Issues in Design and Technology Teaching.* London and New York: Routledge Falmer.

Morrison, J. and Twyford, J. (1994). *Design.* London: Longman.

Myerson, J. (1993). *Design Renaissance*. London: Open Eye.

National Apprenticeship Service (2010). http://www.apprenticeships.org.uk/. (10/09/09).

Newton, D. (2005). *Teaching Design and Technology, 3-11*. London: Paul Chapman.

Nihon Bunkyo (2006a). *図画工作５・６上 (Art and Handicraft* 5&6, 1). Osaka: Nihon Bunkyo.

Nihon Bunkyo (2006b). *図画工作５・６上* (*Art and Handicraft* 5&6, 2). Osaka: Nihon Bunkyo.

Nihon Bunkyo (2006c). *美術１ (Art 1). Osaka: Nihon Bunkyo.*

Nihon Bunkyo (2006d). *美術２＆３上 (Art 2&3, 1). Osaka: Nihon Bunkyo.*

Nihon Bunkyo (2006e). *美術２＆３下 (Art 2&3, 2). Osaka: Nihon Bunkyo.*

Niimura, I. (2003). *広辞苑(Kojien).* Tokyo: Iwanamishoten.

Noman, J. (2000). Design as a Framework for Innovative Thinking and Learning: How Can Reform Education, International Conference on Design and Technology Educational Research Archive, Department of Design and Technology, Loughborough University. Available from http://www.lboro.ac.uk/departments/cd/research/groups/ed/idater/. (01/02/10).

Ofsted (2006). Ofsted Home Page. http://www.ofsted.gov.uk/. (07/05/06).

Osborn, A. (1953). *Applied Imagination, Principles and Procedures of Creative Thinking.* New York: Scribner

Owen-Jackson, G. (Ed.) (2002). Teaching and Learning about Design. In G. Owen-Jackson. *Aspects of Teaching Secondary Design and Technology, Perspectives on Practice.* London: Routledge.

Palinscar, A, S. and Brown, A, L. (1984). Reciprocal Teaching of Comprehension Fostering and Comprehension - Monitoring Activities. *Cognition and Instruction*. Vol. 7, No. 2, pp. 117-1175.

Papanek, V. (1972) (1985). *Design for the Real World*. London: Thames and Hudson.

Parker, J. (2005). A Consideration of the Relationship between Creativity and Approaches to Learning in Art and Design. *International Journal of Art and Design Education*. Vol.24, No.2, pp.186 - 198.

Patton, M. (1987). *How to Use Qualitative Methods in Evaluation*. London: Sage.

Polanyi, M. (1973). *Personal Knowledge.* London: Routledge & Kegan Paul.

Press, M. (1998). New Lives in the Making. In *Learning and Making*. London: The Crafts Council.

Press, M. and Cusworth, A. (1998). A New Vision in the Making: Exploring the Value of Craft Education in the Information Age. *The Design Journal*. Vol. 0, No. 1, pp.12-28.

Pring, R. (2000). Philosophy of Educational Research, London : Continuum.

Project SUMIT (2000). *SUMIT Compass Points Practices*. Available from http://www.pz.harvard.edu/SUMIT/COMPT.HTM. (20/11/05).

Pye, D. (1968). *The Nature and Art of Workmanship.* London: Cambridge University.

QCA (2010). QCA Home Page. http://www.qcda.gov.uk/. (01/03/2010).

QCA (1998). *Design and Technology, Schemes of Work, Key Stages 1&2.* London; QCA.

QCA (2000a). *Art and Design, Schemes of Work, Key Stages 1&2.* London: QCA.

QCA (2000b). *Art and Design, Schemes of Work, Key Stage 3.* London: QCA.

QCA (2000c). *Design and Technology, Schemes of Work, Key Stage 3.* London: QCA.

QCA (2006a). GCSE Criteria for Art and Design. Available from http://www.qca.org.uk/libraryAssets/media/art_design.pdf. (03/08/07).

QCA (2006b). GCSE Criteria for Design and Technology. Available from http://www.qca.org.uk/libraryAssets/media/5677_gcse_dt_criteria.pdf. (03/08/07).

Robertson, S. (1952). *Creative Crafts in Education.* London: Routledge and Kegan Paul.

Robertson, S. (1961). *Craft and Contemporary Culture.* London: Harrap.

Robertson, S. (1989). The Refinement of Touch. *Journal of Art and Design Education,* Vol.8, No.3, pp.241-245.

Robson, C. (2003). *Real World Research*. London: Blackwell.

Rogoff, B. (1990). *Apprenticeship in Thinking: Cognitive Development in Social Context.* Oxford: Oxford University Press.

Ballengee-Morris, C. and Stuhr, P, L. (2001). Multicultural Art and Visual Cultural Education in a Changing World. *Art Education*. Vol.54, No.4, pp.6-13.

Row, W. (1987). *Design Thinking*. Cambridge: MIT Press.

Rutland, M. (2001). Links Across Design and Technology. In G. Owen-Jackson (Ed.). *Teaching Design and technology in Secondary Schools*. London: Sage.

Rutland, M. (2005). Fostering creativity in design and technology at Key Stage 3. Unpublished PhD Thesis. Roehampton, University of Surrey.

Sato, C, F. (2002). Tradition and Innovation in East Asian Ink Painting: Case Studies. Unpublished MA Dissertation. Roehampton, University of Surrey.

Sato, D. (1996). *日本美術誕生* (*Birth of Japanese Art).* Tokyo: Kodansha.

Sato, M. (2005). An Investigation into Teaching Traditional Crafts in Japanese Lower Secondary Schools. Unpublished MA Dissertation. Roehampton University.

Schoenfeld, A, H. (1985). *Mathematical Problem Solving*. Orlando, FL: Academic Press.

Schön, D. (1983). *The Reflective Practitioner: How Professionals Think in Action*. New York: Basic Books.

School Curriculum and Assessment Authority (SCAA) (1997). *Survey and Analysis of Published Resources for Art (5-19)*. London: SCAA.

Sennett, R. (2008). *The Craftsman*. London: Allen Lane/Penguin Press.

Silverman, D. (2000). *Doing Qualitative Research*. London: Sages.

Sjöberg, B. (2009). Design Theory and Design Practice within Sloyd Education. *International Journal of Art & Design Education.* Vol. 28, Issue 1, pp. 71-81.

Sternberg, R. and Lubart, T. (1993). Investing in Creativity. *Psychological Inquiry.* Vol. 4, No. 3, pp. 229-232.

Sternberg, R. and Lubart, T. (1999). The Concepts of Creativity: Prospects and Paradigms. In Sternberg, R. (Ed.). *Handbook of Creativity.* Cambridge: Cambridge Press.

Tokyo Shoseki (2007a). *新しい家庭５・６ (New Home Economics,* 5 & 6). Tokyo: Tokyo Shoseki.

Tokyo Shoseki (2007b). *新しい技術家庭 技術 (New Technology & Home Economics, Technology). Gijutsu,* Tokyo: Tokyo Shoseki.

Tokyo Shoseki (2007c). *新しい技術家庭 家庭 (New Technology & Home Economics, Home Economic).* Tokyo: Tokyo Shoseki.

Tsuneyoshi, R. (1994). Small Groups in Japanese Elementary School Classroom: Comparisons with the United States. *Comparative Education.* Vol. 30, No, 2, pp.115-129.

Tufnell, R. (1998). Making a Connection to Employability. In *Learning and Making*. London: The Craft Council.

Ueno, K. (2001). *まなざしの共有 (Sharing Views)*. Tokyo: Tankosha.

UK Trade and Investment (2007). http://www.ukinvest.gov.uk/ja-JP-index.html. (08/02/09).

Walker, J. (1989). *Design History and the History of Design*. London: Pluto.

Welch, M. and Barlex, D. (2004). Portfolios in Design and Technology Education: Investigating Differing Views. *DATA International Research Conference 2004.* pp193-197. Sheffield, UK, Sheffield Hallam University.

White, J. (1998). *Do Howard Gardner's Multiple Intelligences Add Up?.* London: Institute of Education, University of London.

Williams, C. (2008). Re-thinking the Motives of Do-it-yourself (DIY) Consumers. *The International Review of Retail, Distribution and Consumer Research*. Vol. 18, No. 3, pp. 311-323.

Wood, N. (2004). Unknown Unknowns: Knowledge Elicitation for Multimedia in Craft Learning. Unpublished Paper Presented at Challenging Craft: International Conference, 8-10 September, 2004, Gray's School of Art, Aberdeen, Scotland.

Yano, M., Shibayama, M., Sun, Nishizawa, M. and Fukuda, M. (2002). Concepts and Theories of Creativity. *National Institute of Informatics Technical Report*. June 2002.

APPENDICES

Appendix I
Observation checklist 1: Checklist for departments

School: **Department:** **Date:**

1 Teaching environment

□ Room

□ Equipment

□ Storage

□ Books (resources for students)

□ Computer/ VIDEO/ etc.

□ Materials

□ Teachers' material

□ Visitor

□ Museum/gallery:

□ Extra activity (competition, exhibitions etc)

2 Staffs

□ **Teachers**

Number: (full-time: part-time:)

Their specialists:

□ **Technicians**

Number: (full-time: part-time:)

□ Specialist training/teacher support

3 Documents

□ School prospectus

□ Handbooks

□ Department policies/ Aims

□ Scheme of Work/lesson plan (a whole plan for each year)

□ Assessment technique

□ Examples of lesson plans related to craft activities

□ Examples of students' work

4 Other

Appendix II
Observation checklist 2: Checklist for craft projects

Date:

School:

Year / Grade:

Subject:

Participants (numbers, gender):

Title of project:

Aims of project:

Aims of lesson:

Time and length:

Length of project:

1.0 Learning environment

Location in school, size of room, classroom organization (placement of teacher's and students' desks), specialist equipment for craft, craft displays in the classroom and images of craft work on the walls in the school, Storage facilities.

2.0 Materials and tools

Types of tools, number, condition, shared or not, etc.

3.0 Resources

Details and quantity of textbooks and other visual aides (manuals, history, biography, craftwork (age; traditional or contemporary, where, name of craftsperson) student handouts, worksheets, slides, art museums etc.

4.0 Teaching and leaning activities

Sequence and timing of activities and types of teaching-learning activities
(Lecture, showing videos, slides, or photos, whole class discussion, small group discussion, individual tutoring, question/answer session, demonstration, group study, individual study, presentations, homework/individual research (out of lesson), museum/workshop visiting, etc.)

4.1 Particular concerns

Developing design ideas; what do teachers do to encourage students to explore and develop individual design ideas?

- How a theme/topic is introduced (in written/verbal, open/closed theme)?
- Do teachers show examples of craftwork?
- What kinds of crafts are introduced as examples and how? *(Teachers' craft work or students' work made in previous year, etc)*
- How do teachers stimulate students' design ideas? *(Collecting data/ individual research, looking at craftspeople work, visiting museums, visiting speakers, field trips, displays, discussion, observational sketch, making note or sketchbook, experiments, making models etc.)*
- How do teachers encourage students to keep reflecting on their work? *(watching students' work without being noticed but giving regular feedback to them)*
- How long do teachers give students time to explore and reflect on design ideas?
- How do teachers support students to evaluate their design ideas? *(Discussion, etc.)*

Thinking processes (by Downing, D. and Watson, R.)

- **Analysing and evaluating**: Analysing and evaluating artists, their classmate and peers work, and their own work.
- **Creating and making**: choosing appropriate materials and techniques, making compositional decisions and the progressive development of ideas.
- **Investigation**: as a process that the students were expected to undertake as part of the process of creating an art work, differentiated from research as a taught skill since response included unsupervised research or investigative tasks set as homework.
- **Creative thinking processes**: giving personal responses, experimenting with both materials and ideas and thinking conceptually.

Skills; which craft skills and processes are being taught? And how?

- What kinds of craft skills are taught?
- What strategies are used to teach craft skills? How do students learn/acquire them? *(Observation, showing examples, using textbook/handouts, allowing students to experiment, etc.)*

5.0 Teacher student interaction (Verbal and non verbal)

How are modes of communication?

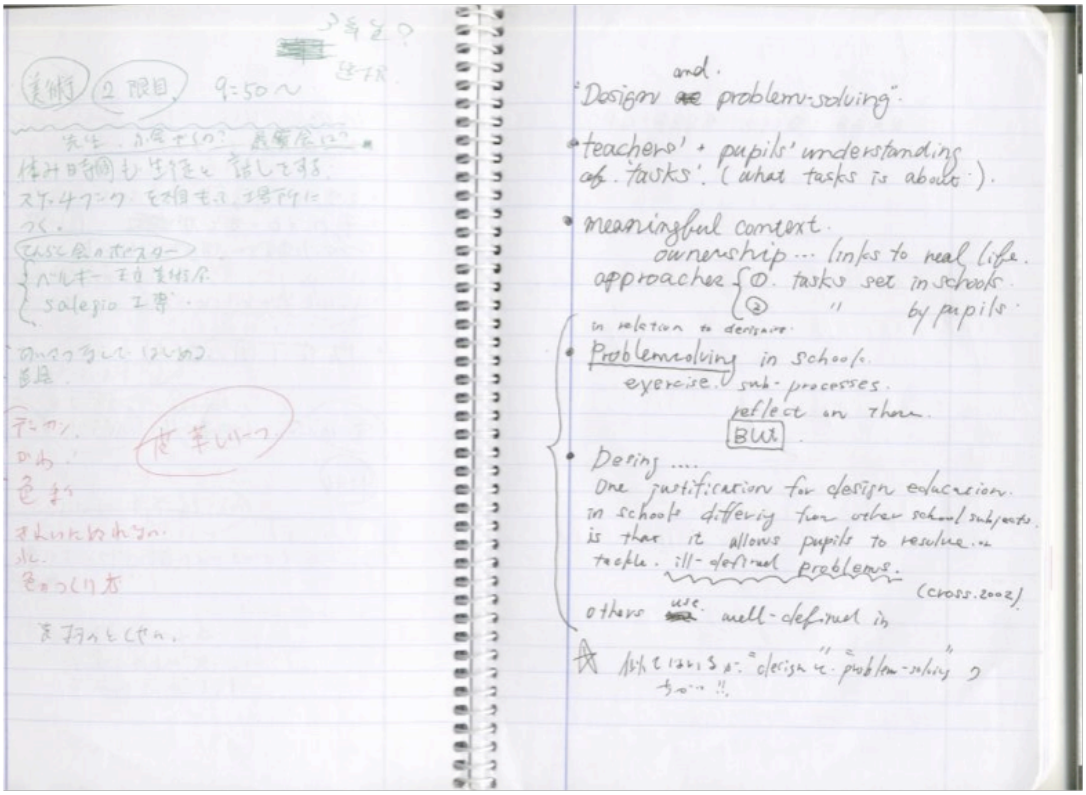
- To what extend do teachers;
  Show a firm friendly, relaxed and encouraging attitude to students?
  Secure the attention of students when necessary?
  Use prise or other form of encouragement?
  Provide opportunities for students to take decisions and responsibilities for their learning?
  Move around the classroom to assist or work with individuals/groups of students?
- When communicating with students to what extend do teachers;
  Allow for maximum participation of students?
  Use clarifying questions?
  Ask questions which encourage imaginative response?
  Use students' responses to encourage further discussions?

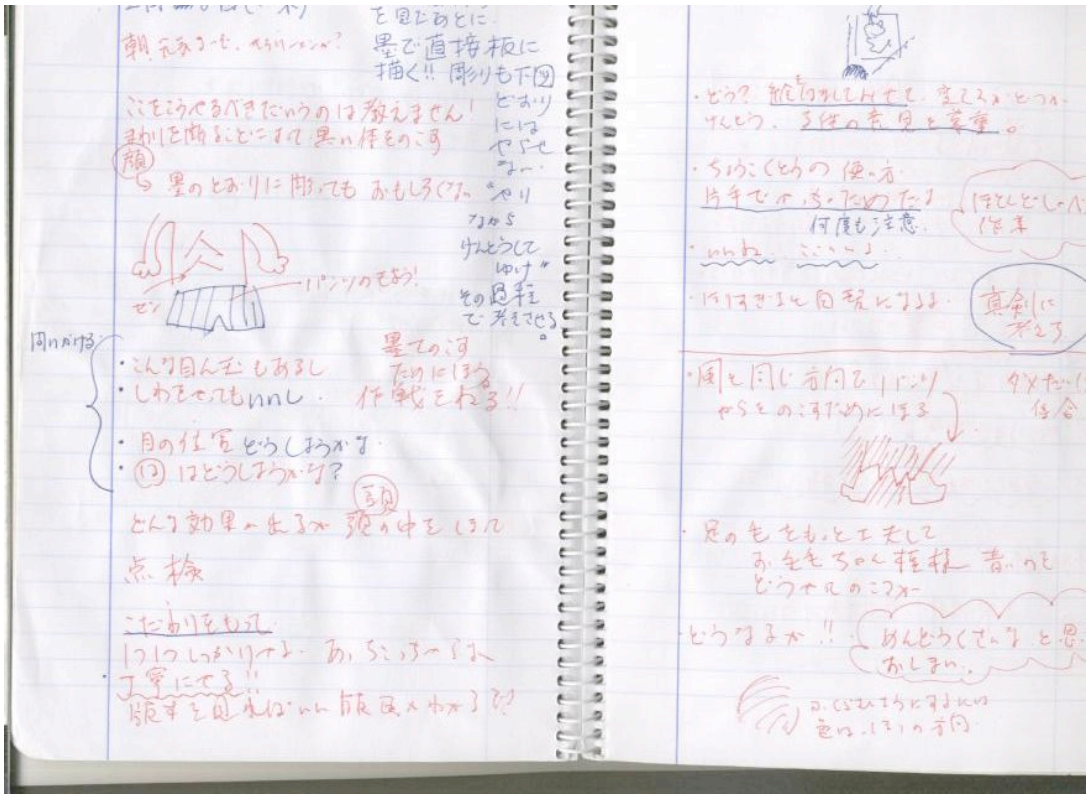
6.0 Method of evaluating student learning

- What kinds of evaluation are used?
- How many stages of evaluation are there?
- Which criteria are used for the evaluation?
- Where are they from?
- Do teachers allow students comment on or mark their own work?

7.0 Miscellaneous notes

Appendix III
Examples of field notes





Appendix IV
Interview schedule for teachers in England

School: **Date:** **Time:**
Name: **Art/D&T specialist:** **Yrs teaching:**

Preamble: Thank you very much for agreeing to be interviewed today. As you know, I am researching into 'the relationship between developing design ideas and skilled knowledge in craft education' because I am interested in comparing it in England and Japan. I want to make it clear you don't have to do this interview if you don't want to. Are you happy about doing it? Our conversation will remain confidential. Do you mind if I record it? If you change your mind at any time, just tell me and I will turn the machine off. Questions are about making activities in clay, metal, textiles, or wood etc.

1. What do come into your mind when you hear the word, 'craft'?
2. Have you ever taught crafts in your lessons? If yes, which ones?
3. In your opinion, what are the similarities and differences between the craft projects in A&D and D&T? If so, what are they?
4. What do you think the distinctive benefits on of including craft activities in school subjects?
5. In your experience, what ways are most helpful for getting your students to generate and develop design ideas in craft activities? *Prompts; How would you help them generate and develop individual design ideas?*
6. What do you think the most effective ways of helping students to develop craft skills?
7. In your opinion, what is the best way of combining the development of design ideas and craft skills?
8. Do you think it is important to work with craftspeople in relation to your teaching and professional development? Could you please give me a reason for your answer?
9. What methods do you use to assess students' craft work?
   Prompts; how many stages are there? What methods do you use? Where do the criteria come from?

Conclusion
In closing, are there any questions you would like to ask me? Or is there anything you would like to say about design thinking and skilled knowledge in craft education?

Thank you very much for giving up your time to help me.

Appendix V
Interview schedule for Art teachers in Japan

School: Date: Time:
Name: Art specialist: Yrs teaching:

Preamble: Thank you very much for agreeing to be interviewed today. As you know, I am researching 'the relationship between design thinking and skilled knowledge in craft education' and I am going to compare it in England and Japan. My research is important to Japan because the government has recently introduced a new national curriculum that emphasises teaching for creativity and creative problem-solving as well as craft skills so that children become autonomous learners and citizens. The opposite is happening in England because my research there has identified that school there do not pay enough attention to improving pupils' competence in manipulating materials, tools, and equipment and processes even though scholars insist this kind of knowledge is important. However, the government emphasises fostering pupils' thinking skills and creativity. I expect that findings from this research to contribute to ideas about how to help pupils to develop their own ideas in skilled-making. Additionally, in comparing findings in Japan and England I hope we can learn from each other.

I want to make it clear you don't have to do this interview if you don't want to. Our conversation will remain confidential. Do you mind if I record it? If you change your mind at any time, just tell me and I will turn the machine off.

The questions are all about *monodukuri (*craft or skilled making in English). I use the Japanese word; *monodukuri* for craft (*kousaku/kougei*) because there are many definitions and they are confused and changing. Also, I am interested in how people make, how you teach making how people learn to make in things that look beautiful because they are skilfully made. So, in this research *monodukuri* means activities involving making something beautiful by manipulating materials and processes.

The term 'design thinking' as used in this research refers to the process by which makers/craftspeople generate and develop their own ideas.'Skilled knowledge' means knowledge of how to creating/produce artworks well through the manipulation and control of materials, tools, and equipment and processes.

前文: 今日はインタビューへの御協力どうもありがとうございます。ご存知のように、わたしは、工作・工芸教育におけるデザインと熟練した知識の関係について研究しております。それらについてイギリスと日本を比較する予定です。新しい指導要領では自ら考え行動できる子供たちを育てるために考える力、例えば創造性や創造的問段解決を実践的なものづくりの力とともに育てることが工作・美術で強調されています。反対にイギリスでの私の調査では材料、道具、器具、ものづくりの

始めに、このインタビューは強制ではありません。インタビューをお受けしていただけますか？私たちの会話の匿名性は守られます。また、インタビューをテープに記録させていただいてもよいでしょうか。もし、お考えが変わりましたらいつでもおっしゃってください、レコーダーのスイッチを切ります。

質問は、ものづくりについてです。工芸という言葉は多くの定義がありその意味において混乱と変化があることが文献調査で明らかになっています。また、私は特に技術的に上手く作られた美しい作品を制作することにおいて、人がどのようにつくり、先生がどのように指導し、人がどのように学ぶかということに関心があります。そこで、このインタビューでは工芸という言葉の代わりにものづくりということばをつかいます。さらに、この研究で'デザイン的思考'は自

分自身のアイディアを生み出し発展させる思考の過程とし、'熟練した知識'は材料、道具、器具やプロセスを操作し使いこなす力とします。

1. Apart from your teaching in school, in your private time, do you make anything? If yes, could you tell me about it?

   学校での指導からはなれて、何かを作ることはありますか？

2. A finding of previous research in Japan and England was that the definition of craft is very confuse/ unclear and is changing in both countries. It was difficult for me to define it for this research because in the specialist literature there are so many different definitions. So I would like to ask how you personally understand the term. What comes into your mind when you hear the word, *kosaku* and *kogei* (craft)?

   以前の日本とイギリスでの調査で工芸という言葉の定義が混乱している、はっきりしない、また、変化してきているということが明らかになりました。私自身、この研究のためにそれらの言葉を定義づける難しさを感じました。そこで、先生ご自身がどのようにそれらの言葉をご理解されているかお話していただきたいと思います。工作・工芸という言葉を聞いてどの様なことが思い浮かびますか。

Please note that in this interview, I'm particularly interested in making in clay, metal, plastic, wood, textiles and other craft materials. But I do include paintings and print making.

3. Which kind of skilled making have you taught in your lessons?

   Prompts; what kinds of materials did you use? What kinds of techniques did you teach? And what kinds of special equipment?

   今までに、どの様なものづくりの活動を授業で行なってきましたか。
   どのような素材や技術、器具の使用について指導されましたか。

4. What do you think the benefits of teaching skilled making in Art? Is it different from other school subjects?

   ものづくりの活動を美術、図工の中に取り入れることにどの様な利点があると思いますか。他の教科と比べてみてどうですか。

5. Do you think your students enjoy/like making or learning how to make things in your lessons? Could you give me reasons for your answer?

   子供たちはものづくりの授業を楽しんでいると思われますか。先生のお答えの理由をお話してください。

6. My preliminary research has revealed that craft was initially introduced into general education in the 19th century as a practical subject in both Japan and England. The development of thinking skills such as problem-solving and creative thinking are being emphasised in contemporary rationales for craft education. What is your own view about this?

   早い段階の文献調査で 19 世紀ごろイギリスと日本では、ものづくりは実践的教科として一般教育の中に取り入れられました。ものづくり教育の有効性について問題解決や創造的発想力といった'思考の発達'、考える力については、近年になって強調されるようになりました。このことについて、先生のお考えをお聞かせください。

7. A British expert on craft has pointed out that making things involves rules like following specific techniques and processes many people assume that following rules necessarily conflicts with freedom of thought, imagination, and expression. In relation to your own teaching in school, what is your own view about this?

   Prompt; do you agree that they are incompatible? Could you give me reasons for your answer?

   イギリス人の工芸批評家の一人が、多くの人が決められた技術や過程のようなルールのあるものづくりではそのルールによって自由な発想、想像性、表現を制限してしまうというふうに考えていると指摘しています。先生の学校でのご指導と関連して、このことについて先生のお考えをお聞かせください。
   それらは矛盾しているという考えに賛成されますか。そのお答えの理由を教えてください。

8. In your experience, what teaching methods are most effective for helping your students to generate and develop their own ideas during skilled making?

   Prompt; how do you help students generate their own ideas？How do you help students develop their ideas further on process?

   先生のご経験から、ものづくりにおいて、どのような手立てが効果的にアイディアの発想と発展を助けるとお考えですか。
   子供たちがアイディアを考え出せるようにどのような工夫をされていますか。さらに、子供たちがアイディアを発展させることが出来るようにどのような工夫をされていますか。

9. In your experience, what are the most effective ways of helping students to develop craft skills? (In this research, 'craft skills' is defined as the knowledge needed to manipulate materials, tools, and equipment and processes, in other word, knowledge of how to make things in practice).

   先生のご経験から、ものづくりにおいてどのような手立てがものを作り上げる知識を身に付け伸ばすのに効果的だとお考えですか。'ものを作り上げる知識'とは、材料、道具、手段を使いこなす力、または、ものを実際に作り上げる知識という意味です。

10. Previous research into craft education in Britain confirmed that students' motivation for making depends on whether they are given opportunities to develop in-depth craft knowledge and skills or not. Learning a little about many kinds of skilled-makings and working with commercial kits does not motivate them. What is your own view about this?

    以前のイギリスの工芸・工作教育の調査で、子供たちのもの作りへの意欲は、どのくらいものづくりの知識について深く学ぶ機会が与えられるかということによるという結論を出しています。 沢山の種類のものづくりをほんの少しずつ学習する、すでにいくつかの工程が省かれている既成のセット教材を使かうことは動機付けには役立たないというように述べています。このことについて先生のお考えをお話してください。

11. Do you think that it is important for teachers to develop and acquire specific craft skills themselves like different kinds of carving for example, *kamakurabori.* Please give reasons for your answer.

    先生方が特別な工芸技術、例えばかたぎり彫り等、を身につけることは重要だとお考えですか。それはどうしてですか。

12. The latest course of study for art in both primary and lower secondary schools suggests that teachers should invite makers from outside of school into their classrooms, for example; people who have made traditional folk crafts? Have you invited any to your lessons? If yes, how did you work with them? If not, do you think it is important to work with them? Could you give me the reason for your answer?

    新しい図工、美術の指導要領では学外から作家の方（例えば、地域伝統工芸の職人さん）に来てもらって授業をすることを促しています。今まで、そういう方に授業に来ていただく、美術館等を授業のために利用されたことはありますか？もし、ありましたら、どのように行いましたか。そういうご経験がない場合でもそれらは重要だと思いますか。お答えの理由をお話してください。

13. The latest course of study for Art & Handicraft and Art suggests that teachers should take children to local museums and galleries. Have you take these to those institutions? If yes, please tell me about it? If not, do you think it is important to use resources? Could you give me reasons for your answer?

    新しい図工、美術の指導要領では博物館、美術館の活発な利用を促しています。今まで、美術館等を授業のために利用されたことはありますか？もし、ありましたら、どのように行いましたか。そういうご経験がない場合でもそれらは重要だと思いますか。お答えの理由をお話してください。

14. What methods do you use to assess students' craftwork?

    Prompts; how many stages are there? What methods do you use? Where do the criteria come from?

    ものづくりのプロジェクトではどのように評価しますか（評価基準と評価方法）？ 評価基準は何を使いますか？どのような評価方法をつかいますか？評価には何段階ありますか？

Conclusion

Are there any questions you would like to ask me? Or is there anything you would like to say about design thinking and skilled knowledge in craft education? Thank you very much for giving up your time to help me.

何か質問はありませんか。ものづくりにおいてのデザイン的思考や熟練した知識について何か話しておきたいことがありますか。貴重なお時間どうもありがとうございました。

Appendix VI
Extract from interview transcriptions: English teacher

School: E5

Date: 23/05/06

Time: 9:35 – 9:50

Department: Art department

Teacher: EK

Background: BA in Photography

Art/D&T specialist: Fine Art/ Head of Art

Sex: F

Yrs teaching: 4

Researcher: What comes into your mind when you hear the word, ‘craft’?

EK: It would be making, handcrafts, creativity, experimentation and touching something you can feel.

Researcher: Have you ever taught crafts in your lessons? If yes, which ones?

EK: We have … I believe that painting is a way of, or a form of, craft. And we also make objects, sculpture in Year 7 and we… we also use clay, which would be a craft. We teach collage, mixed media, a bit of sticking and gluing and composing of pictures. We do every single lesson from Key Stage 3 to Key Stage 4, all skills you learned in Key Stage 3, you would find in Key Stage 4. And then, you use them in Key Stage 5 too. We do teach craftwork but with more personal and individual outcomes.

Researcher: Do you mean they build up skills?

EK: Yes, exactly. Building up skills from Year 7.

Researcher: In your opinion, what are the similarities and differences between the craft projects in Art & Design and Design & Technology?

EK: I would say Art and Design is more related to creativity and conceptual ideas. I don’t know much about Design and Technology. It would be more about actual mapping projects and being more on the engineering side. I would see Design & Technology … whatever they make or you can put into … something a semi-product, something… you can sell and use. Functional and practical. Art is more expressive. How you express yourself. How you put it on paper on a more creative side.

Researcher: What do you think the distinctive benefits of including craft activities in school subjects?

EK: I think it relevant to what we do. I believe that painting skills are important but you can go beyond that. You can learn more by making as well. Different pupils, different abilities. If you spend too much time painting I think some pupils forget what art is and you can say it is not just about paintings. There are so many skills. I would say, in fact, we do making on the sort of artistic side of it. Although we don't call it craft when we do projects, I would say it benefits from being creative. Putting the ideas into 3-D models.

Researcher: In your experience, what ways do you think are most helpful for your students to generate and develop design ideas in craft activities?

EK: It would be talking about it. And it would be showing ideas. It would be about being able to introduce the project but asking questions to make them to realise what it's about. They can actually share ideas between students themselves. They share their ideas although teachers give starting points to them. I would say it's sharing and talking about ideas.

Researcher: The next question is what do you think are the most effective ways of helping students to develop craft skills, making skills?

EK: Making skills. I would say some students ask for demonstrations. For instance, we do demonstrations and show them how to make things as they can see the outcomes for themselves. Break down making processes, step by step. For instance, if we are doing sculpture, we do papier-mâché. In the first lesson, we show how to make a main shape then cover it up with gum tape and then tissue paper and then paint. And in each project, we break it down into different stages, so they really understand how they are going to do it. Then expand the vocabulary you use as well.

EK: The other way…to make them their own mistakes. Some pupils do definitely in their own ways. Sometime, I don't explain it why it doesn't work. They have to see and they have to realise by making in the way that they want to do. That is the excellent way to learn how to make. But, you have to be careful to do that because it's a bit time consuming. But if you have a bit of time we let them do it in their own way.

Appendix VII
Extract from interview transcriptions: Japanese teacher

School: J8

Date: 07/12/06

Time: 10:20 – 10:40

Department: Art department

Teacher: JF

Background: Fine art

Sex: M

Yrs teaching: 23

Researcher: Apart from teaching in a school, in your private time, do you make anything? If yes, could you tell me about them?
学校での指導からはなれて、何かを作ることはありますか？

JF: When I have time, I painted at home.
時間があれば、家では絵を描いたりします。

Researcher: A finding of previous research in Japan and England was that the definition of craft is very confuse/ unclear and is changing in both countries. It was difficult for me to define it for this research because in the specialist literature there are so many different definitions. So I would like to ask how you personally understand the term. What comes into your mind when you hear the word, *kosaku* and *kogei* ?
以前の日本とイギリスでの調査で工芸という言葉の定義が混乱している、はっきりしない、また、変化してきているということが明らかになりました。私自身、この研究のためにそれらの言葉を定義づける難しさを感じました。そこで、先生ご自身がどのようにそれらの言葉をご理解されているかお話していただきたいと思います。工作・工芸という言葉を聞いてどの様なことが思い浮かびますか。

JF: Kosaku is taught in primary schools. Kogei is taught in secondary schools. Kosaku has an element of *asobi* (play) such as *zokei asobi* (playful art), which is an art learning domain in primary schools. *Kogei* is *gei* (the arts). So, it includes *isho* (design) and techniques.
工作っていうと小学校、工芸っていうと中学校、高校って感じがするんですけど。工作っていうとわりと遊びてきな割合が多いのかな、造形遊び的な要素も入ってくるのかな。工芸っていうと芸ですからそこには意匠とかデザイン性もあれば、技術も伴ってこなければ工芸とはいえないのではないか。

Researcher: Which skilled making have you taught in your lessons?
Prompts; what kinds of materials did you use? What kinds of techniques did you teach? And what kinds of special equipment?

今までに、どの様なものづくりの活動を授業で行なってきましたか。どのような素材や技術、器具の使用について指導されましたか。

JF: Wood, clay and paper. We made chopsticks made of bamboo but I have never used plastics. I taught cloisonné. But we needed at least 2 hours for this. Also, I have taught carving.
木、粘土、紙。竹で箸を作ったりね。プラスティックはやったことないね。七宝。でも、２時間は必要かな。あとは、彫とか。

Researcher: What do you think the benefits of teaching skilled making in Art?
ものづくりの活動を美術、図工の中に取り入れることにどの様な利点があると思いますか。

JF: I think art should be used in everyday life. Art is central in our lives. Therefore, it is important for teachers to teach things such as kogei in schools.
私の美術の考え方は生活とマッチしているということ。生活の中心になるような美術。だから、工芸的なものって重要になるのかなって思います。

Researcher: Do you think your students enjoy making or learning how to make things in your lessons?
子供たちはものづくりの授業を楽しんでいると思われますか。先生のお答えの理由をお話してください。

JF: Yes, I think they enjoy it. Time for making is limited in schools. So, we have to consider the relationship between art and technology & home economics.
はい、楽しんでいると思います。やっぱり、技術、家庭科との関係をしっかり持たないといけないですね。時間がない中で広がりがせまくなってしまうので、教科間の関係って大事なのかな。

Researcher: My preliminary research has revealed that craft was initially introduced into general education as a practical subject in both Japan and England in the 19th century. The development of thinking skills such as problem-solving and creative thinking are being emphasised in contemporary rationales for craft education. What is your own view about this?
早い段階の文献調査で 19 世紀ごろイギリスと日本では、ものづくりは実践的教科として一般教育の中に取り入れられました。ものづくり教育の有効性について問題解決や創造的発想力といった‘思考の発達’、考える力については、近年になって強調されるようになりました。このことについて、先生のお考えをお聞かせください。

JF: I think that art contributes to developing students' making skills but also cognitive and affective aspects.
美術の役割っていうのは技術の発達だけではなくて思考的なものや情緒的なものの発達に大きな役割を果たしていると思います。

Researcher: A British expert on craft has pointed out that in making things involves rules like following specific techniques and processes many people assume that following rules necessarily conflicts with freedom of thought, imagination, and expression. In relation to your own teaching in school, what is your own view about this?

イギリス人の工芸批評家の一人が、多くの人が決められた技術や過程のようなルールのあるものづくりではそのルールによって自由な発想、想像性、表現を制限してしまうというふうに考えていると指摘しています。先生の学校でのご指導と関連して、このことについて先生のお考えをお聞かせください。

JF: I think the introduction to each project and my preparations for lessons are important. For example, whether I make something I am going to teach before I started teaching. Also, how to introduce a theme is important. For instance, showing professional work or pictures. They should be things that interest students and stimulate their ideas. Also, I like to show the students how to make things in front of them. There are many different ways… It is effective to get students to discuss so as to stimulate their ideas.

導入段階なんですね。導入段階でいかに準備しておくか。例えば、一つの教材を作るときにどれだけ自分が試してやっていたかとか。どういう、テーマの提示の仕方が取り組みを成功させるかにかかってくると思います。例えば、中学生だけれどもプロの作品を見せたりだとか、写真とかね。あと、いかに面白いか。具体的には、自分で作って見せたりとか。いろいろあるんだけど。あとは、子供たちが自分たちで話し合って発想していくという手もありますね。

Appendix VIII
Teacher consent form: England

Roehampton University

ETHICS BOARD
TEACHER/ CRAFTSPERSON CONSENT FORM

Title and brief description of research project: An Investigation into the Relationship between Deign Thinking and Skilled Knowledge in Craft Education
Phase 1; An investigation into craft projects in general education in England

This research as a whole is investigating into the relationship between creativity and skilled knowledge in craft education. The main aim of this phase of the study is to explore how the projects encourage students to develop and evaluate creative design ideas, become skilled users of tools and materials, and accumulate knowledge of and expertise in specific kinds of craft processes and techniques. The method of investigation is observations of projects, document analysis, formal interviews with participant teachers and craftspeople, and informal interviews with students.

I will carry out observations of craft projects between February and July 2006. The main focus will be on the learning environment, lesson content, aims, resources, and teaching strategies, the interaction between teachers and learners, and how teachers encourage students to develop design ideas and craft skills I will record them in written notes and photographs. I will not photograph participants' faces, only the learning environment, resources, student work, and different phases of production. I hope to interview participant teachers and craftspeople during/after the observations about their roles in projects and perceptions of craft education. These interviews will last for approximately 30 minutes and be audio recorded. Also, I hope to interview participant students about their craft work informally during/after the observations. These interviews will be recorded in written notes. In addition, I would like to access teachers' lesson plans, visual resources and handouts in order to understand project details. The focus of this study is on understanding how teachers and craftspeople encourage students to develop design ideas and craft skills rather than making judgements about their work.

The data collected from the research will be used for academic purposes only including reports at conferences, journal publications and a PhD/MPhil thesis. The anonymity of participant teachers, craftspeople, and students will be protected by the use of code names and interviewees will be able to check summaries of transcriptions of interviews. They will be able to withdraw from this research at the any point.

Name and status of Investigator:
Maho Sato is currently undertaking an MPhil on Art Education at the Roehampton University in England.

Consent Statement:
I agree to take part in this research, and am aware that I am free to withdraw at any point. I understand that the information I provide will be treated in confidence by the researcher and that my identity will be protected in the publication of any findings.

Name ……Signature …… Date ……

Please note: if you have a concern about any aspect of your participation, please raise this with the investigator, or with the investigator's Director of Studies, Prof. Rachel Mason.
Maho Sato (investigator): [redacted] Tel; [redacted], E-mail; [redacted]
Prof. Rachel Mason (Director of Studies): Froebel college, Roehampton University, Roehampton Lane, London, SW15 5JP, UK., Tel; 0044-208-3923009., E-mail; R.Mason@rpehampton.ac.uk.

Appendix IX
Teacher consent form: Japan (Japanese)

Roehampton University

倫理に関する承諾書
美術担当の先生

研究名と研究内容:
工作　工芸教育におけるデザインと制作技術の関係についての研究
Phase 2: 日本の学校での工作　工芸プロジェクト

この研究は、全体として工作　工芸教育におけるデザインと制作技術の関係について調査します。主な目的は、生徒の創造的なデザインアイディアの発展、道具や材料の使用、それぞれの特徴的な工作　工芸技術についての指導について調査することです。研究方法は、授業観察、先生方へのインタビュー、子供たちのグループディスカッションです。

学校での工作、工芸の授業観察は、２００６年の１０月から、２００７年の３月の間に行われます。主に、学習環境、授業内容、資料、指導方法、先生と生徒とのやりとり、デザインアイディア、制作技術の指導に焦点をあてて授業観察を行います。それらは、ノート、写真に記録されます。写真は、学習環境、資料、生徒の学習、作品の記録に使用されます。写真は、参加者の顔に焦点を当てて撮影されません。美術の先生方とそれぞれ 3 回ずつインタビューが行われます。はじめのインタビューは、授業観察の前に先生方のバックグラウンド、指導経験、工作、工芸教育についてです。二つめのインタビューは、授業観察が行われている期間に進行中のその工芸の授業について、授業観察で使用された写真を使って行われる予定です。最後のインタビューは、授業観察終了後、その授業について行われます。生徒とのグループディスカッションは、授業観察終了後、私が観察した授業について行われます。これらの、インタビューとグループディスカッションは、約 30 分でテープレコーダーに録音されます。また、指導案、資料、配布物等、授業の細部の理解のため使用させていただきたいと思います。この研究の焦点は、デザインアイディアの発展のための指導の探求であり、先生と生徒の活動について評価するものではありません。

収集されたデーターは、学会のレポート、機関紙での発表や、研究者の博士論文等の学術的な目的にのみ使用されます。参加していただく方の匿名性は、記号（コードネーム）を使うことで守られます。また、インタビューに参加された方は、インタビューの筆写の要約をチェックすることが可能です。参加者は、調査のどの段階においても、参加を取りやめることができます。

調査員の名前と身分:　佐藤真帆は、現在、イギリスのローハンプトン大学で美術教育研究課程に所属しています。

承諾文:　私は、私がこの研究に参加することに同意し、調査のどの段階においても参加を辞退することができることを認識しています。私は、私が提供した情報が秘密に扱われ、研究結果の発表においても、私のアイデンティティーが守られることを理解しています。

氏名.....　署名.....　日付.....

調査についてご不明な点などありましたら、お手数ですが、研究者本人、または、担当教授のレイチエル　メイソンにお問い合わせください。

佐藤真帆: [redacted] Tel; [redacted], E-mail; [redacted]

レイチエル　メイソン Prof. Rachel Mason (Director of Studies):　Froebel college, Roehampton University, Roehampton Lane, London, SW15 5JP, UK., Tel; 0044-208-3923009., E-mail; R.Mason@rpehampton.ac.uk.

Appendix X
Example of consent form: teacher

Roehampton University

倫理に関する承認書
美術担当の先生

研究名と研究内容：
工作・工芸教育におけるデザインと制作技術の関係についての研究
Phase 2: 日本の学校での工作・工芸プロジェクト

この研究は、全体として工作・工芸教育におけるデザインと制作技術の関係について調査します。主な目的は、生徒の創造的なデザインアイディアの発展、道具や材料の使用、それぞれの特徴的な工作・工芸技術についての指導について調査することです。研究方法は、授業観察、先生方へのインタビュー、子供たちへのインタビューです。

学校での工作、工芸の授業観察は、２００６年の１１月から、２００７年の３月の間に行われます。主に、学習環境、授業内容、資料、指導方法、先生と生徒とのやりとり、デザインアイディア、制作技術の指導に焦点をあてて授業観察を行います。それらは、ノート、写真に記録されます。写真は、学習環境、資料、生徒の学習、作品の記録に使用されます。写真は、参加者の顔に焦点を当てて撮影されません。美術の先生方とそれぞれ３回ずつインタビューが行われます。はじめのインタビューは、授業観察の前に先生方のバックグラウンド、指導経験、工作、工芸教育についてです。二つめのインタビューは、授業観察が行われている期間に進行中のその工芸の授業について、授業観察で使用された写真を使って行われる予定です。最後のインタビューは、授業観察終了後、その授業について行われます。生徒へのインタビューは授業中に行われます。これらの、先生へのインタビューは、約 30 分でテープレコーダーに録音されます。また、指導案、資料、配布物等、授業の細部の理解のため使用させていただきたいと思います。この研究の焦点は、デザインアイディアの発展のための指導の探求であり、先生と生徒の活動について評価するものではありません。

収集されたデーターは、学会のレポート、機関紙での発表や、研究者の博士論文等の学術的な目的にのみ使用されます。参加していただく方の匿名性は、記号（コードネーム）を使うことで守られます。また、インタビューに参加された方は、インタビューの筆写の要約をチェックすることが可能です。参加者は、調査のどの段階においても、参加を取りやめることができます。

調査員の名前と身分： 佐藤真帆は、現在、イギリスのローハンプトン大学で美術教育研究課程に所属しています。

承諾文： 私は、私がこの研究に参加することに同意し、調査のどの段階においても参加を辞退することができることを認識しています。私は、私が提供した情報が秘密に扱われ、研究結果の発表においても、私のアイデンティティーが守られることを理解しています。

氏名 [redacted] 署名 Hiro 日付 2007. 4/20

調査についてご不明な点などありましたら、お手数ですが、研究者本人、または、担当教授のレイチェル・メイソンにお問い合わせください。

佐藤真帆: 12 Brookwood Ave. Barnes, London SW13 0LR, UK. Tel; 07906645395, E-mail; satomaho007@hotmail.com

レイチェル・メイソン、Prof. Rachel Mason (Director of Studies): Froebel college, Roehampton University, Roehampton Lane, London, SW15 5JP, UK., Tel; 0044-208-3923009., E-mail; R.Mason@rpehampton.ac.uk.

Appendix XI
List of school visits: England

School code	Visiting Date	Project or event observed in Art & Design and Design & Technology
Primary schools		
E1	08/02/06	Y6, Art & Design project: *Making It Work* project. Making jigsaws. Working with an artist (mosaic) and a local museum.
E2	17/05/06 24/05/06	Year 5, Art & Design project: papier-mâché (making a fish object). Year 5, Design &Technology: card making.
E3	30/06/06	Year 6, Art & Design and Drama: mask making.
Secondary schools		
E4	14/03/06	Year 9, Art & Design: textile (making a bag). Year 7, Art & Design: mixed media (making a picture by collage). Year 7, Art & Design: pottery (making a small object).
E5	23/05/06 05/07/06	Year 8, Art & Design: mascot design (making a painting). Year 9, Art & Design: paper sculpture (making a object). Year 10, Design &Technology: resistant materials (wood) (making a toy). GCSE and A level Art exhibition and some selected outstanding work at Key stage 3.
E6	18/05/06 14/06/06 28/06/06 18/07/06	Year 9, Design &Technology: resistant materials (metal) (making a photo frame). Year 10 (Design &Technology): textile (making a summer dress). Art & Design and Design &Technology exhibitions. GCSE art show. Year 7 (Art & Design): making sketchbooks and revising this year activities. Origami workshop by me.
E7	09/05/06 16/05/06 23/05/06 05/07/06	GCSE exhibition. AS exhibition. A2 exhibition. Visit the Art & Design Department. Origami workshop by me.
E8	18/07/06 19/07/06	Visit the Art & Design and Design &Technology departments. Arts festival.

Appendix XII
List of school visits: Japan

School code	Visiting Date	Projects in Art lessons
Primary schools		
J1	19/12/06 23/01/07 30/01/07 06/02/07	Year 5, 3D work 1 (Mixed media). Year 5, 3D work 2 (Mixed media). Year 5, 3D work 2 (Mixed media). Year 5, 3D work 2 (Mixed media).
J2	08/02/07 20/02/07 27/02/07 06/03/07	Year 5, woodprint and Year 6, wood work (carpentry). Year 6, woodcraft (carpentry). Year 6, woodcraft (carpentry). Year 6, woodcraft (carpentry).
J3	12/01/07 19/01/07 02/02/07 10/02/07 23/02/07 03/02/07	Year 5, 3D work (clay). Year 5, 3D work (clay) and Year 6, woodcraft (carving). Year 5, 3D work (clay). Year 5, 3D work (clay). Year 5, 3D work (clay). Year 5, 3D work (clay).
J4	13/04/07 20/04/07	Year 5, mud colour painting. Year 5, mud colour painting.
J5	07/02/07	Year 5, clay flute.
J6	09/11/06	Art exhibition.
J7	01/12/06	Art exhibition.
Secondary school		
J8	07/12/06 15/02/07 25/02/07	Year 1, woodcraft (tape cutter). Year 2, mixed media (box art). Year 3, wood clock and poster.
J9	22/12/06 10/02/07 21/02/07	Year 2, painting (trick art). Year 3, stone carving. Year 3, clay sculpture.
J10	21/12/06 22/01/06	Year 3, woodcraft1 (object) & 2 (relief). Year 3, woodcraft (object) & 2 (relief).
J11	19/01/07 26/01/07 16/02/07 02/03/07	Year 1, woodcraft (pot stand). Year 1, woodcraft (pot stand). Year 1, woodcraft (pot stand). Year 1, woodcraft (pot stand).
J12	02/11/06	Year 3, woodcraft (hand glass).
J13	30/11/06 08/03/07	Year 3, woodcraft (kaleidoscope). Year 3, woodcraft (kaleidoscope).